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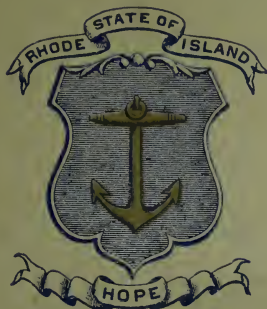
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BULLETIN OF RHODE ISLAND STATE COLLEGE

VOL. XV NO. 4

FOR FEBRUARY 1920

REPORT OF THE BOARD OF MANAGERS



KINGSTON R. I.

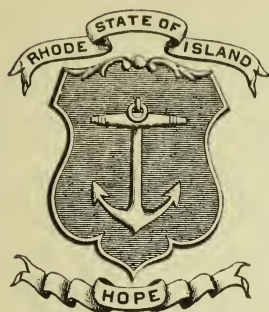
1920

PUBLISHED QUARTERLY BY THE COLLEGE
MAY, AUGUST, NOVEMBER, FEBRUARY

ENTERED AT KINGSTON, RHODE ISLAND, AS SECOND-CLASS MATTER

The Pawtucket Linotyping Co., Pawtucket. R. I.

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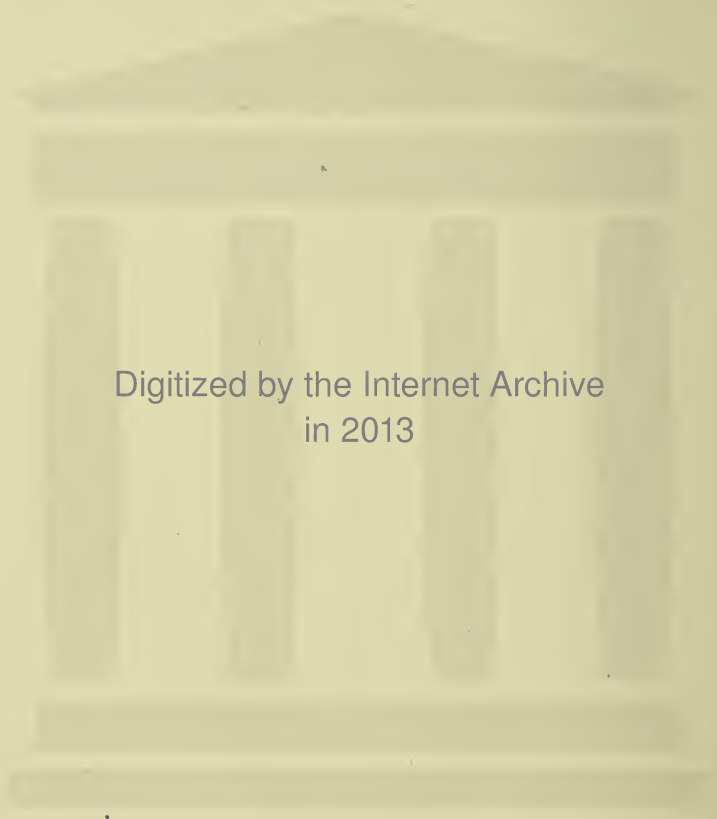
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RHODE ISLAND STATE COLLEGE

CORPORATION.

HON. WALTER E. RANGER, <i>President</i> , State Commissioner of Schools, <i>ex-officio</i>	Providence
HON. ZENAS W. BLISS, <i>Vice-President</i> ,	Providence Co., Providence
HON. ROBERT S. BURLINGAME, <i>Clerk and Treasurer</i>, .....	.....
.....	Newport Co., Newport
HON. THOMAS G. MATHEWSON,	Kent Co., East Greenwich
HON. CHARLES ESTES,	Bristol Co., Warren
HON. ROWLAND HAZARD,	Washington Co., Peace Dale
HON. PHILIP A. MONEY, Member of State Board of Agriculture, Exeter	

BOARD OF VISITORS FOR 1919-20.

MR. FRANK L. PIERCE, <i>Chairman</i> ,	Providence
MRS. RICHARD JACKSON BARKER,	Tiverton
MISS CAROLINE HAZARD,	Peace Dale
DR. JOSEPH B. MUNROE,	Warren
MRS. WALTER RODMAN,	Lafayette
MR. ISAAC L. SHERMAN,	Newport
MRS. DAVID J. WHITE,	Davisville

REPORT.

*To His Excellency R. Livingston Beccckman, Governor, and the
Honorable General Assembly of the State of Rhode Island
and Providence Plantations, at its January Session, 1920:*

I have the honor to submit herewith the Thirty-Second Annual Report of the Board of Managers of Rhode Island State College, as required by law.

WALTER E. RANGER,
President, Board of Managers.

REPORT OF THE PRESIDENT OF THE COLLEGE.

To the Honorable Board of Managers of Rhode Island State College:

GENTLEMEN: The following is a statement of the work of the year 1919 and the conditions prevailing during the time under consideration.

HISTORY OF THE YEAR.

At the end of the year 1918 the National Government released its control of the college and discontinued its payments for the maintenance of armed troops in training for the war. During the greater part of the year, the college had been a military camp, controlled and directed in the main by the military necessities of the service and managed by a military commandant and his staff of army officers in co-operation with our own civil organization under a more or less definite contract with the War Department. All our resources—our buildings, our equipment, our teaching and administrative personnel—were transformed into a military machine for the rapid development of men into soldiers capable of service along definite lines. Under these conditions seven hundred and eighty-three men were passed through the combined military and civil training instituted here.

It will be readily recognized that so drastic a transformation did not take place without serious injury to our physical equipment and the impairment of our academic traditions and organization. A great part of the work of the year has consisted of the rehabilitation of our academic life, the reorganizing of our physical resources and the replacing of our personnel depleted by the exigencies of the war.

PHYSICAL REHABILITATION.

It will, of course, be readily understood that the work done in 1918 under army auspices was in no sense that which college

courses require. The demand was for handicraft efficiency. Even in the Student Army Training Corps the theoretical training in art and science was reduced to the lowest possible terms and the students' days were filled with duties pertaining to the soldier's life. Every building with one exception had been diverted from its original purpose to new and strange uses. Furniture and apparatus had been removed and stored in such places as could be reserved—many times in places unsuited for either the safety or the proper care of the material stored. In their places army furniture and the appliances for army training had been installed. Laboratories had been dismantled, class-rooms turned into offices, fraternity houses into barracks.

Now, at the beginning of the year 1919, the problem was to reverse the previous process, to transform a military camp into a college campus once more. And this we found to be a strangely difficult and somewhat costly process. It was no light task to re-install laboratories, to refit lecture rooms, to transform mess-halls into dining-rooms, and barracks back again into dormitories and fraternity houses. Apparatus was found to be out of condition, new instruments had to be bought and new furniture purchased. The labor, too, in making all these changes was no slight element of cost.

REESTABLISHMENT OF COLLEGE LIFE AND ACTION.

The physical rehabilitation was fairly easy of accomplishment in comparison with the difficulty of rebuilding the mental and spiritual life, traditions and habits of an institution of learning. At the opening of the year, in January, few of the upper classmen had returned and the comparatively large number of new students had to rely on their own resources for organizing and guiding their college life. It must not be forgotten, too, that their high-school life had been abridged and foreshortened by the war excitement, by the closing of schools on account of the fuel shortage, by the release of boys and girls for war emergency work, and by shortage in the teaching force. Many of them came, too, from the Students Army Training Corps and had to form new habits of intellectual effort as contrasted with physical strain and endurance.

Very soon the men released from the camps and from overseas

duty came dropping in, to take up the work where they had left it off a year or more ago. But the transition from the alarms of war, from a life of vigorous and sustained physical effort, under the open sky, from the constant excitement and change of scene in the army to the quiet life of the student was a most trying experience. With the best of will they found it difficult to steady and focus the mind on the pale tasks and tepid interests of college routine. Many of them expressed themselves as surprised and disappointed at their own mental phenomena. They realized as never before the vital importance of college training. They came back matured of purpose and eager for advancement; yet they found themselves unable to control the wandering attention or to fix their interest. It all seemed "stale, flat and unprofitable." As they expressed it, they could not "find themselves." The whole year has not sufficed to offset this waste of war, and it will take much time and effort still to bring back the old eager intellectual zeal; the steady response to mental stimulus, the powerful ideals and traditions that constitute the charm and efficacy of college life.

REPLACEMENT OF PERSONNEL.

Still another phase of the mark of rehabilitation during the year has been the filling out of the faculty to the degree necessary to take care of the influx of students. The total enrollment for the academic year, September, 1918, to July, 1919, was 402, but under the S. A. T. C., as the academic instruction was slender, the number of instructors necessary was much smaller than the same number of students would have required under ordinary academic conditions. After the reorganization in January, the total number of students was reduced to 255. Moreover, it was practically impossible to secure new instructors at that time. Such rearrangement of classes and readjustment of courses was made as was possible and the college year to July 1 was finished as best we could with an inadequate staff of teachers.

The process of faculty reduction began early in 1917 with the enlistment of faculty members in various phases of war work and the coincident decrease of the student body from 336 in 1916 to 251 in April, 1918. At that time the actual number of the academic staff engaged in teaching was seventeen.

The effort to fill vacancies began as soon as it was evident that war conditions were about to cease. The list of new appointments includes six full professors, three assistant professors and six instructors. Other new officers are an Extension Director of Home Economics and three new assistants in the Experiment Station. No small part of the difficulties of the year have lain in the fact that so large a proportion of our faculty personnel was new to our conditions and requirements and had to labor under such handicaps. Furthermore, many of the new appointees had themselves just returned from war work, and had to readjust their own mental habits and point of view to new environment.

All these factors of rehabilitation together with others which we shared with the general public in the way of unusual labor conditions, readjustment to the high plane of prices, and consequent difficulties of decrease in the purchasing power of a fixed income, have created new problems of college administration which had to be solved without guiding precedents, and have greatly affected the efficiency of the year's work. Nevertheless much has been accomplished, readjustment has largely been brought about, and we have reason to feel thankful that in the process no disasters have occurred and that the prospect for the future is bright.

CHANGES IN THE FACULTY.

The following is a record of the changes taking place in the personnel of the employees during the year.

Resignations.

Professor Leonard P. Dickinson, professor of electrical engineering, resigned early in the year to take a very flattering appointment in Robert College, Constantinople, Turkey.

Mr. Fred M. Walker, appointed January first as physical director and coach for six months, resigned at the end of his term of appointment.

Captain W. E. Dove, re-appointed January first at our earnest instance as professor of military science and tactics, was retired to the inactive army list on July first by the War Department in

pursuance of a general policy of relieving retired army officers from active duty.

Dr. Virgil L. Leighton, for many years professor of chemistry, retired at the beginning of the college year in September to carry on the management of his farm.

Dr. Edward H. Perkins, assistant professor of chemistry and geology, resigned September first to take a professorship of geology in Western University, London, Ontario.

Miss Florence H. Myrick, instructor in modern languages, resigned September first because of ill health.

Mr. Wm. R. M. Scott, instructor in horticulture, resigned July first.

From the Extension Service Miss Gladys L. Meloche, state leader in home economics, resigned to take further courses at the University of Wisconsin.

Mr. George H. Baldwin, specialist in agronomy, retired on July first.

Miss Dorothy W. Caldwell, assistant in pathology in the experiment station, resigned July first.

Appointments.

The following new appointments have been made both to fill positions vacated as indicated in the foregoing record and also to revive positions that had lain dormant during the war. It will be noted that the chemistry department has been strengthened by raising the assistant professorship to a full professorship. The modern languages have also been made a department with a full professor in charge.

On January 1, Mr. Fred M. Walker was appointed physical director. Mr. Walker had been serving as physical director in the U. S. Naval Training Station at Newport. He resigned in June.

On March 1, Mr. Mahlon G. Knowles was appointed instructor in mechanical engineering. Mr. Knowles obtained the degree of B. S. in Mechanical Engineering at Tufts College in 1917, and enrolled as a graduate student in the Department of Education at Harvard University, leaving there to enlist in the service of the

U. S. Shipping Board in April, 1918, and becoming marine engineer.

On March 1, Mr. Frank Olson was appointed instructor in mechanical engineering. Mr. Olson was a student at Massachusetts Institute of Technology, and taught for over a year in the shops of that institution. He also had two years of experience in the shops of the Watertown Arsenal and other plants.

On March 1, William R. M. Scott was appointed instructor in horticulture. Mr. Scott was a graduate of the Ontario Agricultural College, 1909, and received the B. S. A. degree from University of Toronto, 1911; also M. S., from Purdue University, 1918. He engaged in practical work as a fruit grower from 1911 to 1914 and was instructor in farm crops at Purdue University, 1916-18.

On March 1, Mr. Frank J. Rimoldi was appointed instructor in horticulture. Mr. Rimoldi is a graduate of Connecticut Agricultural College in 1913, and obtained the degree of B. S. from Cornell University, 1917. He has served as entomologist in the Connecticut Agricultural Experiment Station, as fruit specialist at New York State College of Agriculture, as extension entomologist and horticulturist for southern New England and as plant quarantine inspector for Texas. He was made assistant professor of horticulture on September 1.

On July 1, Miss Helen E. Peck was raised in rank from instructor in English to assistant professor of English Literature.

On September 1, Dr. Emma Gertrude Jaeck was appointed professor of modern languages. Miss Jaeck obtained the degree of B. S. at the University of Wisconsin, 1903; studied at Berlin during 1905-06, and was given the degrees of M. A. and Ph. D. at the University of Illinois. She has taught in Mt. Holyoke College and was professor of German and Spanish in Oxford College, Ohio, 1915-19.

On September 1, Lester E. Merrill, B. S., New Hampshire State College, 1918, was made instructor in horticulture. Mr. Merrill enlisted and served overseas between graduation and his appointment here.

In September, Mr. Joseph W. Ince, A. B., Brown University, 1902, and M. A., 1904, Brown University, was appointed professor

of chemistry and head of that department. He was instructor in chemistry for one year at Brown University, was demonstrator of chemistry at McGill University for three years, and then went to North Dakota College of Agriculture, as professor of chemistry.

In September, Mr. Henry Louis Jackson, B. S., Massachusetts Institute of Technology, 1905, and M. S., Hamilton College, became professor of industrial chemistry. He was instructor at the Institute for one year, assistant professor of chemistry in the University of Kansas for five years, state chemist of Idaho for four years, and instructor in chemistry at North Dakota Agricultural College. In November, 1919, he was sent by the United States Government as one of several nutrition experts to France and served in connection with hospital and camp kitchens.

In September, William Anderson became professor of physics and electrical engineering. Mr. Anderson obtained the degree of B. S. at Kansas State College in 1898, M. S., from the same institution in 1906, and M. A., Cornell University, 1911. He was instructor in mathematics and physics in Kansas State College, and later became assistant professor of physics and electrical engineering at Michigan College of Mines.

In September, Mr. Frederick J. Murray, A. B., Georgetown University, 1915, succeeded Mr. Walker as physical director. He spent two years as athletic director in the Gloucester High School, and served in the aviation branch of the U. S. Army.

In September, Mr. Wayland M. Burgess, R. I. S. C., 1919, was appointed instructor in chemistry. In September, Miss Elizabeth Hemphill was appointed instructor in physical training for women. Miss Hemphill is a graduate of the Savage School for Physical Education, New York City, and has completed courses given by the Swedish School of Gymnastics and Massage and the Summer Camp of Physical Education conducted by New York University. She has conducted classes at the Savage School and also private classes in Swedish Gymnastics and Folk Dances. On September 30, the War Department detailed Captain Alfred S. Knight as professor of military science and tactics.

DEPARTMENT OF EDUCATION.

It should be observed especially that an arrangement has been

entered into with the Rhode Island Normal School by which several things have been accomplished. In order to meet the need for science teaching in the schools, for the training of competent teachers in vocational work in agriculture, science, and home economics, and for supervision of such work, a Department of Education has been created and all work previously done by the English department in psychology and education has been transferred to this department.

CO-OPERATION WITH THE STATE NORMAL SCHOOL.

To man this department, three members of the faculty of the Rhode Island Normal School have been appointed as professors in the college as follows: Dr. Charles Carroll to the chair of School Law and Administration; Dr. Grace E. Bird to the chair of Educational Psychology; and Professor Guy F. Wells to the chair of Education. These teachers will each give part of their time to corresponding courses in this institution. Reciprocally, two of our professors, Miss Bessie E. Bemis and Mrs. L. L. Peppard, will give courses in the Normal School.

DEGREE OF BACHELOR OF EDUCATION.

Furthermore, a course has been laid out on the completion of which the degree of Bachelor of Education will be awarded. This course is composed of two years of work in the Normal School and two years of work at the college. It is so arranged that the student may take the first two years either at the Normal School or at the college, accomplishing the second two years either at the college or the Normal School. In other words, to complete the four-year course and receive the degree of Bachelor of Education from the college, the student must successfully complete two years of work in both institutions, beginning at either institution as he or she may elect.

The course is divided into three options so far as the college part is concerned, viz: two years in agriculture and the basic sciences on which scientific agriculture rests; or two years in science—chemistry, botany, zoology, geology, physics and bacteriology—plus

certain work in foreign language and mathematics; or two years in home economics and its basal sciences.

TEACHER-TRAINING COURSES IN VOCATIONAL EDUCATION.

In this same connection and under an agreement with the State Board for Vocational Education, the college has undertaken the teacher-training work in agriculture and home economics. To this end four-year courses in these subjects have been established leading to the degree of Bachelor of Science. The first two years are the same both in entrance requirements and in content with the corresponding regular course in those subjects. The last two years include subjects in education, pure and applied to vocational work. The vocational subjects are taught by the supervisors of vocational education appointed by the State Board for Vocational Education, viz., for agriculture, Mr. William T. Spanton, B. Sc., B. A., and for home economics, Miss Ethel A. Wright.

ATTENDANCE.

The attendance for the year 1919-20 is the largest in the history of the college, numbering 342 students. The entering class has an enrollment of 143, an increase over the previous year of fourteen per cent. In view of the conditions considered at the beginning of this report, it had seemed best to limit our total enrollment to 340, and this decision was adhered to as closely as possible, necessitating the exclusion of some applicants. So far as possible all applicants from this state meeting our entrance requirements were admitted. The proportion of attendance from within the state is the largest by far that we have had, being eighty-three and one-third per cent. It is doubtful if it is desirable that the percentage of attendance from outside the state should ever be lower than at present. A college should always offer some opportunity for more than a local acquaintanceship and commingling of its students. An interchange of students between states has genuine educational value not only in widening the sympathies and enlarging the mental horizon, but also in producing betterments and strengthening standards by friendly rivalry.

The previous year was so abnormal that comparisons with it are

of little value. Yet it may be noted that the number of students in the courses in agriculture this year shows a marked increase over that of the previous year, indicating a movement of return to the popularity of that course in former years. The registration in the engineering courses is twenty-nine per cent. over that of the previous year, and of 23.6 per cent. over that of the highest previous year in the history of the college. The standing obtained by our engineering courses in the opinion of educators is a matter on which the college may well congratulate itself, and its value to the people of the state is shown by the steadily increasing readiness to avail themselves of its advantages. The applied science course shows an increase of thirteen per cent., and the home economics course an increase of twenty-eight per cent., while the new education department is just beginning to attract students. The total number of women students has shown a steady increase throughout a number of years, and the increase over last year is especially gratifying, being twenty per cent.

As a whole, these increases, taxing our present capacity to the utmost limit, are a gratifying indication that the college is meeting a genuine need of the people and that its value in opportunity for training for service to the state is being recognized and utilized in ever widening degree. Especially is this evidenced in the increase from Providence County over the highest previous year of 31.7 per cent., from Providence itself of 36 2-3 per cent., and from Newport County of 75 per cent., and from Newport city of 17 per cent.

TABLES SHOWING ANALYSIS OF ATTENDANCE.

TABLE No. I.

Showing Attendance by Classes During the Years from 1917-1920.

Classes.	1916-17	1917-18	1918-19	1919-20
Graduate Students	6	2	2	4
Seniors	38	25	32	41
Juniors	51	46	43	53
Sophomores	94	65	48	88
Freshmen	122	98	125	143
Irregular	8	7	5	3
Total, college courses.....	319	243	255	332
Two-year courses	17	8	..	10
Student Army Training Corps.....	..	..	268	..
Total	336	251	523	342
Names repeated .....	..	..	121	..
Total .....	..	..	402	..
Two Mechanics Units.....	..	..	515	..
Total	336	251	917	342

TABLE No. II.

Showing Number of Men and Women, of New and Previous Matriculates, and Number in the Several Courses by Classes, for Collegiate Year 1919-20.

CLASS	SEX		DATE OF MATRICULATION.		REGISTRATION IN COURSES.					
	Men	Women.	Previous to 1919-1920.	1919-1920.	Agriculture.	Engineering.	Applied Sci.	Home Econ.	Education.	Total.
Graduates	3	1	1	3	..	..	4	..	..	4
Seniors	34	7	41	..	10	19	5	7	..	41
Juniors	41	12	53	..	12	25	5	9	2	53
Sophomores	72	16	87	1	9	50	14	15	..	88
Freshmen	121	22	8	135	19	89	13	22	..	143
Irregular	2	1	2	1	..	..	2	1	..	3
Total, college ...	273	59	192	140	50	183	43	54	2	332
Two-Year	10	..	..	10	10	..	..	..	..	10
Grand Total	283	59	192	150	60	183	43	54	2	342

HOME RESIDENCE OF STUDENTS.

A. Resident outside of the State:

Connecticut:		Fall River	2
Essex	1	Groveland	1
Hartford	2	Haverhill	1
New London	2	Mansfield	3
Wethersfield	1	Methuen	1
		Lynn	1
	6	Needham	1
		North Attleboro	6
		North Easton	1
Massachusetts:		North Leominster	1
Avon	1	Plainville	1
Boston	1	Sandwich	2
Bridgewater	2	Swampscott	1
Brockton	16	West Wrentham	1
Chatham	1		
Dorchester	1		42

New Jersey:

Lakewood	1
Newark	1
Paterson	1
—	
	3

New York:

Astoria	1
Brooklyn	2
Elmhurst	1
Forest Hills	1
New York City.....	1
—	
	6

Total attendance from without the state..... 57
or 16 2-3% of total attendance.

B. Resident by Counties and Towns:

Bristol County:

Barrington	2
Bristol	8
Warren	4
—	
	14

Warwick	4
West Warwick	7
—	
	20

Newport County:

Jamestown	2
Little Compton	3
Middletown	1
Newport	13
New Shoreham	1
Tiverton	1
—	
	21

Providence County:

Burrillville	2
Central Falls	2
Cranston	5
Cumberland	3
East Providence	18
Lincoln	4
Pawtucket	16
Providence	123
Smithfield	1
Woonsocket	17
—	
	191

Washington County:

Hopkinton	5
North Kingstown	3
Richmond	1
South Kingstown	17
Westerly	13
—	
	39

Kent County:

Coventry	4
East Greenwich	5
—	
	9

Total attendance from within the state..... 285
or 83 1-3% of total attendance.

Entrance Statistics for Class Registering in 1919.

Total enrollment of class.....	143
Entering with condition of one-half unit, required work.....	25
Entering with condition of one unit, required work.....	21
Entering with condition of one and one-half units, required work.....	9

SUMMARY.

Received from high schools.....	132
Received by transfers from other colleges.....	3
Re-classified and repeating freshman subjects.....	8
Total	143

FINANCES.

In contrast with the flattering statistics of attendance which we have just been considering, our financial status is far from satisfactory and demands serious attention and prompt remedial measures.

The two points deserving careful consideration are, first, that during the year 1919 we have not been able to live within our income, and, secondly, that the needs of the year 1920 are much beyond what we have been receiving from the State. These conditions are the result of a cumulative process of increasing costs throughout five years with a stationary income to meet these costs. The college is now in the condition of a man with a growing family and a stationary income who has finally exhausted whatever reserve in the way of old clothes and stored up supplies he may have had, while his rent has been increasing and he cannot meet the costs of existence reduced to its lowest terms.

During the last five years the college has reduced its expenditures on all controllable items like apparatus, printing, advertising, improvements in equipment, etc., to the lowest possible limit, using up its reserves in these directions and hoping each year for better conditions in prices. These hopes have not been realized nor are they in prospect for the future.

Let me point out that for the last five years the income from the United States Government for instructional purposes has remained stationary at \$52,500; that the State maintenance fund has likewise remained stationary at \$40,000 with the exception of the year 1919 when we had five thousand dollars additional for maintenance; and that the only variable in income has been the current fund. This fund has increased somewhat over 1917, the total amount being \$6,791.99. This difference is almost entirely due to the increase in attendance.

It may be necessary to explain, in connection with the statement comparing 1919 with 1917, that it is quite impossible to make comparisons with the year 1918. That year was entirely abnormal in finances as in everything else. The National Government controlled both income and outgo. Even the headings under which we normally classify receipts and expenditures hardly served their usual purpose, and these receipts and expenditures were swollen much beyond any amounts dealt with in other years. In all comparisons, therefore, the year in question has to be omitted. It is only necessary to recall in regard to it two things: (1) that, as was shown in my report of one year ago, some \$22,500 of State funds were absorbed in the work of training men for the National Army, and (2) that the net income was to cancel an indebtedness of \$1,774.02, and in addition to enable us to commence the year 1919 with a credit balance of \$2,356.02.

COMPARISON WITH THE THREE-YEAR AVERAGE, 1915-17.

In order to grasp the effect of the advance of the price scale in 1919, it has seemed well to me to give here a table showing under analytical headings the differences between the averages of expenditures in the years 1915, 1916 and 1917 and the expenditures of 1919.

COMPARATIVE TABLE, SHOWING AVERAGE EXPENSES 1915-1917
AND EXPENSES 1919, ANALYZED UNDER HEADINGS.

	Expense		Difference	
	Average 1915-17	1919 Expenses	Less	More
Advertising	817.65	580.55	237.10	
Apparatus	1610.65	2304.30		693.65
Auto and Stable Supplies.....	518.07	939.44		421.37
Books and Periodicals.....	693.67	726.95		33.28
Commencement	342.38	*1394.31		1051.93
Construction and Repairs.....	5214.95	7145.86		1930.91
(Minor)				
Dorm. and Farm Rents.....	1733.96	2405.20		671.29
Entertainment	767.46	195.58	571.88	
Feed	3077.34	3933.95		856.61
Fertilizer	568.01	62.58	505.43	
Freight and Express.....	478.94	810.88		331.94
Fuel	10844.20	12147.78		1303.58
Furniture and Fixtures.....	394.77	1877.36		1482.59
Gasoline and Oil.....	924.54	1606.64		682.10
Janitor Supplies	108.77	381.16		272.39
Labor	15321.46	22654.20		7332.74
Laboratory Supplies	1335.87	2718.48		1382.61
Live Stock	92.25	1338.00		1245.75
Postage, Printing, Stationery....	2910.92	2198.40	712.52	
Salaries	59049.12	68368.26		9319.14
Seeds	284.28	342.64		58.36
Telephone and Teleg.....	486.04	929.54		443.50
Tools and Machinery.....	297.65	989.65		692.00
Travel	1645.45	1725.28		79.83
Miscellaneous	3031.29	3277.22		245.93
Electric Current		498.37		498.37
Refunds	167.95	866.81		698.86
	112,717.65	142,419.44	2026.93	31,728.73
				2,026.93
				29,701.80
				or 26%

It will be noted that the total increase in expense for the year 1919 has been twenty-six per cent. over that of the average of the three years previous to 1918. It is worth observing also that the increase in salaries has been 15.8 per cent.; while the increase in labor has been 47.8 per cent.; and that of commodities purchased has been 34 per cent. It should further be observed that of the

\$9,319.14 salary increase, \$1,543.58 is due to the necessity of paying larger salaries to new men and women than previous incumbents in the same or similar positions had been receiving, and these larger salaries had to be offered in order to induce competent persons to come to us at all. It will therefore be seen that the aggregate increase of salary made to older employees has been \$8,775.56. That is to say that, in the two years 1918 and 1919, remarkable for enormous advances in all the necessities of life, and marked by an increase of forty-seven per cent. to labor at the institution, the salaried personnel of the college have received an increase of not quite fifteen per cent.

Even our labor increases do not compare with increases to labor in factory or shop or farms all over the country. As to the increase in material costs, it is incumbent on me to say that the only reason it is not larger is because we have kept down purchases to a degree that means an actual shabbiness in the outfitting of the daily life of the college. This is a subject on which I do not care to enlarge, but our people, students and faculty, feel it and casual visitors remark on it. Unfavorable comparisons are frequently drawn between our facilities and those of landgrant institutions in neighboring states. Farmers reproach us, for instance, because we cannot show the live stock of which other institutions boast, and their reproaches are justified by the facts.

It may be well to take up in detail here some of the comparative items which may be commented upon.

The live stock item shows a very large relative increase. For several years special requests for appropriation to buy land and stock were made. In 1916-17 a very earnest effort was made to get such appropriation. The yearly funds of the college did not permit of purchases from that source. Hence, the small three-year average of expenditure under the heading of live stock. The rented farm during 1918 and 1919 gave a gain in the farm department of some \$1,500, and the demand both from farmers and from the department itself that this money be turned back into the department in the shape of live stock came with all the force of simple justice. Hence the expenditure of \$1,338 for live stock in 1919. This expenditure should be kept up for several years.

The increase in expenditure under the head of commencement

will no doubt cause comment. The description of the commencement occasion as given later under another heading will explain that four different programs covering four days are grouped under that heading. There were the annual exercises for the graduation class marking the close of the college year. Then there were the exercises commemorating the twenty-fifth anniversary of the founding of the college. In the third place, we held a victory celebration, welcoming back our soldier boys from the war. And finally we arranged a memorial service for those who did not return—our hero dead who gave their lives for their country. I do not believe that any citizen of the State will think the money for these purposes wrongly or carelessly spent.

Such items as apparatus, construction and repairs, furniture and fixtures, laboratory supplies, and tools and machinery, which show considerable increases, in one case over two hundred per cent., are due partly to increased prices and partly to the necessity of restocking laboratories and appliances in some degree at least.

DEFICIT.

Under the conditions explained in the foregoing paragraphs it was impossible to continue the work of the college and keep within our income. This was foreseen in October, and a conference was held by a committee of your Board with State officials. The situation was frankly explained, the alternatives being to close the college or to face a deficit. It was recognized by the conferees that the latter was the only reasonable course open to us. Every effort was used to make the deficit as small as possible; nevertheless the amount of the uncovered bills presented to the State Auditor January 7, 1920 was \$9,436.86.

This result is explained as follows:

The receipts for the year were—

1890 Morrill Fund.....	\$50,000 00
1862 Morrill Fund.....	2,500 00
State Maintenance	45,000 00
Current Fund	31,105 96

In addition were used—

Credit balance from 1918.....	2,356 02
Legitimate items charged to Morrill Fund in treasury for the six months from January to June, 1920	2,020 60

\$132,982 58

The expenditures as per foregoing table were.....	142,419 44
Leaving the uncovered amount as before stated.....	\$9,436 86

REQUESTS OF THE GENERAL ASSEMBLY.

By vote of your Board it was directed that two requests for funds be introduced into the General Assembly, in January, 1920, as follows:

- I. To increase the maintenance fund by.....\$40,000
 - II. To add to the amount previously appropriated for building an agricultural and administration building, the sum of 45,000
 - I. The considerations leading your body to request so large an increase in the maintenance fund were as follows:
 - a. Increased requirements.
 1. In order to fill vacancies in the teaching force, which was gradually diminished from the year 1916-17 (when our student enrollment was nearly as large as at present) to January 1, 1919, it was, in every case, necessary to pay larger salaries than the previous incumbents had received. The present payroll is \$6,084 per month or \$73,008 per year. The salary total for 1919 was \$68,368.26. The difference between the present salary rate \$73,008 and the total of \$68,368.26 will require additional funds for 1920 to the amount of..... \$4,639 74
 2. To make advances in salaries now paid in accordance with subsequent discussion of salaries at this institution, the sum of 12,000 00 will be needed, an advance of 16.4 per cent. over the present payroll.
 3. To fill out teaching needs for the current year, three additional instructors at \$1500 each are needed, making..... 4,500 00
-
- Total of increased requirements..... \$21,139 74

b. Decreased resources.

We used in the year 1919 certain sums which are not available in 1920 as follows.

- (1) Special maintenance fund granted by the State for 1919 only \$5,000 00
- (2) Credit balance on hand January 1, 1918, from the military operations of 1918..... 2,356 02

(3) Amount of bills for 1919 and from the Morrill fund in the treasury properly belonging to the six months from January to June, 1920; said bills being payable from the Morrill fund according to law.....	2,020 60
(4) Deficit as previously reported.....	9,436 86

Total decreased resources.....	\$18,813 48
--------------------------------	-------------

The sum of increased needs and decreased resources as stated in the foregoing is.....	\$39,953 22
---	-------------

The foregoing reasoning assumes:

(1) That it is extremely conservative to estimate the same total of expenditure for labor and material in 1920 as in 1919. That amount was, as shown by the comparative table previously given	\$74,051 18
(2) That, in addition to the salary payroll of 1919.....	68,368 26
the increases of salary named under (a) should be granted, totaling	21,139 74

And creating a total expense budget of.....	\$163,559 18
---	--------------

(3) That the existing resources for 1920 are as follows:	
Morrill Fund 1890.....	\$50,000 00
Morrill Fund 1862.....	2,500 00
Statutory State Maintenance.....	40,000 00
(4) And that the receipts of the Current Fund will equal those of said fund in 1919, namely....	31,105 96

Making total receipts.....	\$123,605 96
And leaving uncovered excess of expenditures over receipts for 1920, as before, of.....	39,953 22
	<hr/> \$163,559 18

SALARIES.

As this whole discussion so largely turns upon the matter of salaries, I am giving below (1) some figures tending to show that our professors and teachers have been underpaid for some years back, and (2) that the increase asked for is far from unreasonable under existing economic conditions:

(1) Our salaries are below those of any other college of our class in New England with the exception of the University of Maine, while our living costs, with the exception of rents, are certainly as high as and indeed probably higher than those of the

other colleges, since these costs are absolutely governed by the prices prevalent in Providence. While our people are not in the least inclined toward the method of the strike, yet they are seriously discontented with their situation, and some of our best men have made it known that they cannot remain with us unless something is done to increase their income. Should they leave, it would mean that we should have to go into the market of better-paid men to bid away from these other institutions the teachers we should need. It is unfair, uneconomic, and inefficient to compel such changes of position in order that men may obtain fair pay for good work. Below is a table showing comparative salaries in our own and similar institutions.

Salary Scale taken from "Statistics of State Universities and State Colleges," published by Bureau of Education, Department of the Interior, Washington, D. C. Issued June, 1918.

STATE	PROFESSOR.	ASST. PROFESSOR.	INSTRUCTOR.
Connecticut	\$2800—1600	\$1700—1200	\$1800— 600
Massachusetts	3600—2500	2500—1600	1600—1200
Maine	2300—1700	1800—1200	1300— 800
New Hampshire	2600—1800	2000—1200	1600—1000
Vermont	3000—2700	2300—1800	1800— 800
Rhode Island	2400—1800	1800—1500	1500— 900

It is a well known fact, of course, that these public institutions in New England do not pay the salaries that are paid by privately endowed institutions for similar positions.

(2) The increase asked for is sixteen per cent. on the present salary scale. Many of our instructors frankly say that they are unable to live on their present stipends. Laborers' wages are in many cases more than what they receive. A flat sixteen per cent. increase would not bring their salaries to an equality with those now being paid in similar institutions for similar work, and it is to be recollected that all over this land college men are leaving college positions in order to take work in industrial lines. Should our present instructors leave us, it would be difficult to find others to take their places, and the increase in salary that would have to be paid to induce men to come to us would be from thirty to fifty per cent. more than we are now paying.

II. The \$45,000 requested as an addition to the building fund is also made necessary by the enormous increase in building costs. When the original need for the building was recognized by the General Assembly, and the first appropriation was made in 1917, the building could then have been constructed with that appropriation, according to plans submitted at that time. As war was declared within a few days after the appropriation was made, it seemed to the Board not in accord with the demands and spirit of the time to proceed with the building. In 1919 it was seen that costs had greatly advanced and that the same plans as before would cost more money to realize in a building. A further appropriation was sought and obtained; the whole amount, with the exception of \$5,000, to be available in 1920. Now we find that the most careful estimates on the same plans amount to \$150,000. To meet this need the \$45,000 additional is asked. The most conservative opinion on the part of all persons consulted is to the effect that it would be uneconomic to cut down the plans and build a structure that would not meet the present needs of the institution nor be in keeping with the other buildings on the grounds.

Discussion of the need for this building will be found in the Report for 1916, where the discussion is elaborated in full detail. The need was fully and frankly recognized in the legislative session of that date. The conditions have not changed in the years that have intervened, except that in the war time those conditions have remained in abeyance. Now, with the opening of the year 1919-20, when students have come to us in numbers never before equaled, when every facility is overburdened, and when we face for 1920-21 a still larger influx of students, the need is accentuated and emphasized. It would be a genuine calamity to young people of our state if the need were not met.

As having a general bearing on this whole discussion of finances, showing that our maintenance request is not in excess of, nor even equal to what other institutions are receiving from their states; showing, further, that our building request will not place us on an equality in building facilities given by their respective states to neighboring landgrant institutions, I am adding certain statistical comparisons taken from a bulletin sent out by the Bureau of Education and giving statistics for 1917-18.

COMPARATIVE STATISTICS.

I. There were five landgrant colleges in the United States (continental) which in point of student attendance were smaller than Rhode Island. I give them below together with yearly maintenance from the State and from the United States, total yearly income, and total value of their land, buildings and equipment.

State	Population	State Maintenance	Yearly Income from U. S.	Total Income	Value of Plant
Connecticut	1,254,926	\$95,000	\$78,726	\$359,220	\$1,060,881
Delaware	214,270	*	*	*	1,423,129
Maryland	1,368,240	101,658	110,658	242,124	820,665
New Mexico	416,470	119,606	99,102	257,530	330,000
Nevada	108,776	145,034	92,221	274,275	883,155
Rhode Island	620,090	40,000	90,582	162,256	485,905

*Not reported.

II. The following landgrant colleges, although their attendance is larger than ours, are comparable because of location.

Maine	774,914	149,202	101,702	375,129	961,326
Massachusetts	3,747,564	364,500	79,927	584,632	1,714,943
N. Hampshire	443,467	59,075	115,574	297,348	647,000
Vermont	364,322	67,280	100,063	328,087	1,541,222

III. The following landgrant colleges are receiving State funds far in advance of the amounts received yearly from the United States Government.

California	1,979,058	119,433	3,486,625	14,246,784
Illinois	2,083,263	160,085	2,825,409	6,896,956
Indiana (Purdue Univ.)	663,058	140,483	1,204,183	2,340,000
Michigan	561,000	138,086	1,004,760	1,616,027
New York (Cornell)	743,645	333,386	2,759,965	9,694,280

IV. The following are the only states that are not more than duplicating the yearly income received from the United States Government by annual State appropriations. I have added here a column showing how many cents the state is paying for each dollar of Federal money, and another column showing income from endowment funds.

State	Population	State Maintenance	Yearly Income from U. S.	No. of Cents of State Funds to Each Dollar of U. S. Funds	Endowment or other Income other than Student Fees, etc.
Alabama	2,348,273	\$102,445	\$125,761	.81	\$21,440
Maryland	1,368,240	101,658	110,658	.92	6,543
New Hampshire. .	443,476	59,075	115,574	.51	39,865
Tennessee	2,296,316	110,585	134,536	.82	26,252
Texas	4,472,494		173,415		1,231,901
Vermont	364,322	67,280	100,063	.67	35,890
Rhode Island.....	620,090	40,000	90,582	.44	2,500

The foregoing tables would indicate that the maintenance appropriation made in Rhode Island is much lower than that made by any other state in the Union in 1917. It will also be noted that, in every case except that of Rhode Island, where the State is not appropriating dollar for dollar for maintenance as compared with United States funds received, the difference is closely if not entirely made up by endowment or other income.

In the case of Texas, the college has received from the State a magnificent endowment from public lands that renders annual State aid unnecessary.

BOARDING RATES.

The boarding department, along with everything else, gives cause for constant watchfulness. The year started in with an overdraft of \$2,327.29 and closed with a credit balance of \$292.15. During the last two or three months of the year it became clear that the boarding department was losing money again, and the rate was increased to \$5.50 per week to take effect February 10, 1920. On account of the frequent and violent fluctuations in commodity rates it is a question whether it would not be better to have at the end of each three months a reckoning up of the boarding operations of the period and apportion out to each boarder his share

of the profit or loss incurred. Our effort is to furnish board as nearly at cost as possible, and such a procedure would seem to enable us to approximate more closely to this ideal.

ACTING AS PURCHASING AGENT FOR COLLEGE EMPLOYEES.

In this connection it is a question that has arisen in my mind whether, as the salaries in the institution are below those of privately endowed institutions and will remain so in the future, it is not the duty of the college, in connection with the operating of the boarding department, to purchase staples also for the college employees, giving them the benefit of the lower rates which the college is able to obtain and enabling employees to make the money they do obtain go somewhat farther. Such action has been strongly opposed in the past, but it would seem that there is much justification for it at the present time, fully as much, indeed, as there is for buying and selling books for students. I wish that the matter might be given consideration.

FRATERNITY HOUSES.

It gives me pleasure to report that during the year the Rho Iota Kappa fraternity has purchased the house on the north road built and owned by Professor Boardman. They have remodeled it on the inside somewhat, and now have a very pleasant and comfortable fraternity house.

For some years the Theta Chi fraternity has owned a lot in the village, and on it they are now building a large and handsome new house.

It is very encouraging to see these evidences of initiative, enterprise and thrift on the part of our student organizations. These new additions to the general resources of the college as a community will be of very great benefit to the college as a whole, and reflect credit on the fraternities themselves.

ATHLETICS.

If the war has taught us any one thing, it is the sacredness of the human body and the necessity of training for its care and development. No college course is wise or effective unless it includes

training of this kind. Here at Rhode Island I fear we have not given sufficient attention and time to this phase of our work. Moreover our equipment lacks in many respects the proper appliances and facilities for such work. Of the first importance, however, is the personality of the physical director. And here the difficulty in a small college, in which the duties of the coach in the various games must be performed by the director, is to obtain a man who will interest himself, not only in turning out a winning team, but also in the physical development of all students. The latter is just as important as the former, and is a direct and decisive contributor to the building up of successful teams.

Another matter in this connection is that time, not outside of the daily program, but within it and constituting a legitimate and recognized part of it, should be provided and assigned for athletic sports and exercises. Our faculty has taken this matter up for consideration and will, no doubt, formulate a policy in this connection.

BLANKET TAX.

The blanket tax is a fee of ten dollars per year collected at the office from each student for the support of athletics, the student publication called the *Beacon*, outside lectures, the glee club, and other student activities. Its administration is carried on by a committee composed of students and faculty. This tax has become insufficient for the support of these enterprises, and the students, recognizing this fact, petitioned your body that this compulsory tax on them be doubled. That some increase in this tax is legitimate and necessary seems well established, and I would recommend that further action on this matter be taken.

RESERVE OFFICERS' TRAINING CORPS.

Shortly after the opening of the year proposals were received from the War Department looking to the re-establishment of the Reserve Officers' Training Corps. Accordingly an infantry unit was arranged for under Captain W. E. Dove, who was reappointed here during the first part of the year. In June, however, the Department retired Captain Dove. For two months the position remained vacant and I became quite uneasy. Finally, however,

after several "false starts" at making the appointment and after withdrawing one appointee actually announced, ordered here and on the grounds for three days, in deference to the demand of another institution for the said appointee, Captain Alfred S. Knight arrived and took charge of the unit.

A somewhat humiliating disappointment for us lay in the failure of the War Department to carry out its offers with regard to the establishment of a coast artillery unit here. There was much correspondence concerning this matter; two or three successive inspectors visited us and assured us of favorable reports, and subsequent letters from the Department so far assured us that we felt warranted in announcing the organization of the unit. Subsequently the Department, in reply to a letter making inquiry as to the detail for the unit, informed us that the establishment of the unit could not be carried out.

CREDITS FOR WAR SERVICE MEN.

The year has been marked by the return to college of some one hundred and twenty men who served in the army or navy either overseas or in our own country. These men came back greatly matured by their term of service, with a wider outlook on life, frequently with practical experience in the work to which their college courses led, and always with sound and rigorous training in the school of the soldier, in contact with men and affairs, and in the broadening education which travel gives. It seemed to the faculty only fair that these advantages over more immature and inexperienced students should be recognized, and accordingly, it was voted by the faculty that service of a year or more should entitle the returned student to forty credits, and six months or more to twenty credits, on his course.

CARNEGIE LIFE INSURANCE AND STATE PENSIONS.

Communications from the Carnegie Foundation explaining their life insurance plan for college professors and instructors received careful and extended consideration from our faculty. It was their matured judgment that the plan possessed no advantages over commercial insurance sufficient to offset inherent disadvantages.

In this connection information was asked of the State Com-

missioner of Schools on the question whether members of the faculty of this college are eligible to share in the benefits of the State system of teachers' pensions. The reply was that they were not excluded from its benefits except in so far as the law provides that the term of service entitling the teacher to a pension shall be reckoned from the date of the teacher's state certificate to teach. As none of our faculty holds such certificate, although several of them have worthily served the state for a large part of the term of service stipulated in the law, it is evident that deserving men and women are thereby automatically excluded from benefits which their fellow laborers in common school, high school, and normal school throughout the state enjoy. I would recommend to your body that some method of remedying the situation be devised, in order that the attractiveness of positions at the State College may to that degree be enhanced. In this connection it should be said that our teachers are at a disadvantage as regards State favor in comparison with the professors of Brown University in that they pay taxes on every dollar of property they hold while Brown professors are exempt up to the value of \$10,000.

SCHOLARSHIPS FROM WOMEN'S CLUBS.

It is gratifying and encouraging to be able to record that in many ways from time to time the State Federation of Women's Clubs has shown interest in the work of the college and especially in our young women. We are under deep obligations to them for this interest and the exercise of their influence in our favor on more than one occasion. Especially do I desire at this time to acknowledge obligation for the awarding of two scholarships of fifty dollars each for women at this college during the year 1919-20. The recipients were Miss Esther W. Peterson, 1920, and Miss Amy A. Whitford, 1920.

The same acknowledgments are due to the Triangle Club of the State College. These ladies have in many ways been helpful to the college. As an exemplification of this helpfulness they independently bestowed a scholarship of fifty dollars for the year 1919-20 on Miss N. Doris Kinne, 1922.

EXPERIMENT STATION AND EXTENSION SERVICE.

The work of these two important divisions of the college has

gone on steadily during the year, and the report of the Director of each will be printed in conjunction with this report.

Attention should be called to the fact that as in all other departments expenses for the year have been here, too, heavier than in former years.

Work in the experiment station cannot be curtailed without throwing away the results of many previous years, because the period of such experiments covers a number of years, and conclusions and deductions cannot be made without the data of the whole period. I note with increasing alarm the steady diminution of the resources of the station. In 1917 the loss in the miscellaneous fund was \$379.84, in 1918 it was \$2,911.80, in 1919 it was \$1,222.21. The total drain, therefore, during the three years, on the station miscellaneous fund has been \$4,513.85, and the credit remainder in that fund at the beginning of 1920 is \$957.05. It is evident that this procedure, without remedy from some source, will result in disaster before the end of the year 1920. A modest request for \$4,000 for the purpose of helping these departments was made to the General Assembly in 1919 but was not granted.

It is a pleasure to note the appreciation that the work of these divisions has called forth in the state. Farmers are deeply appreciative of the value of the experiments carried on by the station. Visits to the plots are frequent, and the work is a guide and inspiration to them in their own procedure.

The extension workers are everywhere desired and welcomed. There is between the college force of workers and the county agents and assistants a growing co-operation and cordiality. The boys and girls' club-work is remarkably popular and successful. It is perhaps the one feature of college work in which Rhode Island is in the forefront as compared with other states. We are fortunate in being able to secure as successor to Miss Gladys L. Melóche who resigned in September, 1919, Mrs. Ida S. Harrington, who will commence her work here in January, 1920. She takes the position of state leader in home economics. Mrs. Harrington will be remembered as the very successful state director of home economics under the State Food Administrator in 1917 and 1918.

ALUMNI ADVISORY BOARD.

During the troublous times of the recent past the alumni advisory board has been comparatively inactive. Beginning with the

year 1920 the Board will undertake its helpful labors again. The Board for 1919-20 consists of the following members:

Harry R. Lewis, 1907.

Walter Doll, 1912.

Rhobie L. Cargill, 1909.

Lucius A. Whipple, 1908.

Marguerite W. Elkins, 1913.

James R. Esty, 1914.

BOARD OF VISITORS.

The Board of Visitors for the year 1920 consists of the following members:

Chairman, Mr. Frank L. Pierce, of Providence.

Mrs. Richard Jackson Barker, of Tiverton.

Miss Caroline Hazard, of Peace Dale.

Dr. Joseph B. Munroe, of Warren.

Mrs. Walter Rodman, of Lafayette.

Mrs. David J. White, of Davisville.

Mr. I. L. Sherman, of Newport.

Appointed very late in 1919 they have had no opportunity to visit the college and make a report.

THE COMMENCEMENT OCCASION.

As previously pointed out, the Commencement occasion had a four-fold character.

(1) The twenty-fifth anniversary of the foundation of the college occurred in 1917. The entrance into the war made the celebration of the event in that year impossible. The earliest subsequent opportunity to celebrate it came in June, 1919, and the celebration harmonized most happily with the Victory Celebration which we desired to have all our war heroes attend. Accordingly invitations were sent out to all alumni and former students. The response was most gratifying. Old students registered for the occasion and were entertained by the college. The program of the morning, June 28, was as follows:

Presiding Officer, Professor Harry R. Lewis, 1907.

Greetings by Dr. K. L. Butterfield, former President of the College

Dr. H. J. Wheeler, former Director of the Experiment Station.
Development of the Landgrant College Idea in Rhode Island,

Miss Lucy C. Tucker, Registrar

The Story of the College,

Professor George E. Adams, 1894, Dean of Agriculture

The Meaning of the College to Its Alumni,

Mr. Lucius A. Whipple, 1908, President of Alumni;

Supt. State Home and School

The Function of the State College in the Educational System
of the State,

Dr. Walter E. Ranger,

State Commissioner of Public Schools

(2) The exercises of the Commencement proper consisted of a Class Day Program, June 28, with a very successful evening presentation of "As You Like It" by the young women of the college; a baccalaureate address on Sunday morning by the writer, entitled "Seeing Eye to Eye" and the graduating exercises on the Monday morning following. Addresses were given as follows, by Governor Beeckman, by Dr. F. W. MacNair, President Michigan College of Mines, by Dr. Zenas W. Bliss, Tax Commissioner of State of Rhode Island, and by Dr. W. C. Bagley, Professor of Education, Columbia University.

The graduating class numbered thirty-two and in addition, as signaling the twenty-fifth anniversary, honorary degrees were bestowed on the following persons:

The degree of LL. D. on Judge Clark H. Johnson, former Chief Justice of the State Supreme Court.

The degree of Sc. D. on—

President F. W. MacNair, President of Michigan College of Mines.

Professor W. H. Kenerson, Prof. of Mechanical Engineering, Brown University.

Hon. Zenas W. Bliss, State Tax Commissioner of Rhode Island.

The degree of D. Education on—

Professor W. C. Bagley, Professor of Education, Columbia University.

Professor Frank E. Thompson, Principal, Rogers High School, Newport.

(3) In welcome to the army and navy men returning from the war to the Alma Mater whom their deeds so gloriously honored, and devoutly, thankfully and joyously to signalize our nation's victory, a Victory Celebration was held on Monday afternoon, at which Admiral Sims was the chief speaker. Other speakers on the program were three of our own men; one a private, one a lieutenant, and one a captain, who had all seen hard service at the front, two of them having been seriously wounded. They were Carl E. Fritz, Canadian Siege Battery; Franklin H. Springer, Lieutenant, 165th U. S. Infantry; and Alphonse A. LeBocuf, Captain, U. S. Marine Corps.

(4) In commemoration of our honored dead who made the supreme sacrifice for their country a simple yet most beautiful and touching memorial service was held on Sunday afternoon. The speaker of the occasion was Rev. F. A. MacDonald of Westerly, himself a war veteran. The soloist, Miss Bessie E. Birch, sang "In Flanders Field," to music arranged by Dr. Jules Jordan especially for the occasion. After the address a curtain on the platform was drawn aside revealing an altar over which hovered a cast of the Winged Victory and which was guarded by two soldiers and a sailor. Up to the altar in slow and solemn procession moved twenty-three white-clad maidens, each bearing a wreath of laurel. As each one reached the altar, she placed on it her wreath and speaking quite clearly and distinctly pronounced the name of the dead hero she commemorated along with the formula, "In loving memory of.....who died to defend his country, the college places on her altar this wreath, symbol of victory and undying remembrance." After this ceremony taps were blown by two buglers. The effectiveness of the simple ceremony was almost too intense. The solemn repetition of the formula, varied only by the name of the dead, was cumulative like the tolling at night of some deep-toned bell. The exercise concluded with the singing of "Sleep, Comrades, Sleep" by the congregation.

All of which is respectfully submitted.

HOWARD EDWARDS,

President.

Rhode Island State College,
Kingston, Rhode Island
March 8, 1920.

REPORT OF THE TREASURER.

R. S. BURLINGAME, TREASURER, *in account with the different funds of RHODE ISLAND STATE COLLEGE, for the year ending December 31, 1919.*

MORRILL FUND OF 1890 AND NELSON ACT OF 1907.

1919.

Jan. 1.	To Balance on hand.....	\$24,422 55	
July 1.	U. S. Warrant for year ending June 30, 1920.....	50,000 00	
Dec. 31.	By Text and Reference Books.....	\$121 57	
	Instruction	46,699 10	
	Seeds and Plants	42 81	
	Periodicals	46 95	
	Laboratory Supplies	1,695 98	
	Apparatus	937 89	
	Feed	874 44	
	Live Stock	1,338 00	
	Binding	19 50	
	Tools and Machinery.....	140 74	
	Photos, Charts, etc.....	12 94	
	Miscellaneous	90 68	
	Balance on hand.....	22,401 95	
		<hr/>	
		\$74,422 55	\$74,422 55

MORRILL FUND OF 1862.

1919.

Jan. 1.	To cash from landscrip fund.....	\$2,500 00	
Dec. 31.	By instruction	\$2,500 00	
		<hr/>	
		\$2,500 00	\$2,500 00

SMITH-LEVER FUND OF 1914.

1919.

Jan. 1.	To balance on hand.....	\$6,084 81	
	U. S. Warrant for year ending June 30, 1920..	11,491 82	
Dec. 31.	By Salaries	\$7,331 57	
	Traveling	2,029 25	
	Stationery and Printing.....	673 67	
	Postage and Telephone.....	123 85	

Supplies	140 65	
Furniture and Fixtures.....	301 16	
Library	65 79	
Publications	355 83	
Labor	113 19	
Tools and Machinery.....	79 20	
Scientific Apparatus	95 19	
Contingent Expenses	2 00	
Balance on hand.....	6,265 28	
	<hr/>	<hr/>
	\$17,576 63	\$17,576 63

STATE—MAINTENANCE FUND.

1919.

Jan. 1.	To State Appropriation.....	\$45,000 00	
Dec. 31.	By Salaries	\$12,370 09	
	Traveling	992 28	
	Labor (Janitor, Farm, etc.).....	12,024 08	
	Postage, Stationery, Printing.....	830 29	
	Construction and Repairs.....	4,133 18	
	Fuel	5,462 90	
	Stable and Auto Supplies.....	714 95	
	Fertilizer	1 08	
	Seed	214 09	
	Electricity	64 60	
	Rental of Land.....	640 00	
	Oils and Gasoline.....	747 68	
	Feed	1,664 53	
	Furniture	1,217 59	
	Tools and Machinery.....	817 05	
	Janitor Supplies	195 40	
	Apparatus	472 48	
	Water Rate	60 00	
	Laboratory Supplies	272 06	
	Commencement	555 32	
	Books	27 91	
	Miscellaneous	1,522 44	
		<hr/>	<hr/>
		\$45,000 00	\$45,000 00

STATE—REPAIRS AND IMPROVEMENTS.

1919.

May 1.	To State Appropriation.....	\$10,000 00
Dec. 31.	By Repair Material.....	\$4,863 90

Repair Labor	5,136 10	
	<hr/>	<hr/>
	\$10,000 00	\$10,000 00

STATE—BUILDING.

1919.			
Jan. 1.	To Balance on hand.....		\$79,629 99
June 30.	Additional Appropriation		25,000 00
Dec. 31.	By Architect	\$2,767 21	
	Balance on hand.....	101,862 78	
		<hr/>	<hr/>
		\$104,629 99	\$104,629 99

CURRENT FUND.

1919.			
Jan. 1.	To Balance on hand.....		\$2,356 02
	Reserve Fund		2,000 00
	Dormitory Fees		8,906 28
	Department Fees		4,319 58
	Department Sales		9,632 32
	Department Service		3,135 65
	Interest		699 87
	Tuition		2,365 84
	Laboratory Sales		1,059 71
	Miscellaneous		986 71
	Amount overdrawn		9,436 86
Dec. 31.	By Postage and Stationery.....	\$1,368 11	
	Freight and Express.....	810 88	
	Traveling	929 54	
	Telephone and Telegraph.....	733 00	
	Labor (Farm, Fireman, etc.).....	5,768 92	
	Labor—Student	4,861 20	
	Construction and Repairs.....	3,012 68	
	Laboratory Supplies	750 44	
	Tools and Machinery.....	31 86	
	Electricity—Narragansett Power ..	433 77	
	Oils and Gasoline.....	858 96	
	Auto and Stable Supplies.....	224 49	
	Rental	1,705 25	
	Fertilizer	61 50	
	Seed	85 74	
	Entertainment	195 58	
	Salaries	6,799 07	
	Janitor Supplies	185 76	
	Furniture	659 77	

Books	480 13	
Fuel	6,684 88	
Advertising (Including Track)....	580 55	
Feed	1,394 98	
Refunds	866 81	
Apparatus	893 93	
Binding	17 95	
Commencement	838 99	
Miscellaneous	1,664 10	
Reserve Fund	2,000 00	
	<hr/>	
	\$44,898 84	\$44,898 84

TRUST FUND.

1919.

Jan. 1.	To	Boarding Receipts	\$57,305 55	
		Store Receipts	7,599 69	
Dec. 31.	By	Balance overdrawn	\$2,327 29	
		Boarding	54,907 47	
		Store	7,378 33	
		Balance on hand.....	292 15	
			<hr/>	
			\$64,905 24	\$64,905 24

HATCH FUND.

1919.

Jan. 1.	To	balance on hand.....	\$8,962 98	
		United States check for quarter	3 750 00	
Apr. 1.	United States check for quarter.....		3,750 00	
July 1.	United States check for quarter.....		3,750 00	
Oct. 1.	United States check for quarter.....		3,750 00	
Dec. 31.	By	Balance	\$6,339 99	
		Labor	3,530 21	
		Publications	1,964 52	
		Postage and Stationery.....	130 69	
		Freight and Express.....	177 06	
		Heat, Light, Water and Power.....	465 48	
		Seeds, Plants and Sundry Supplies..	268 74	
		Fertilizers	1,337 30	
		Feeding Stuffs	482 09	
		Library	64 34	
		Tools and Machinery.....	89 82	
		Furniture	2 25	
		Live Stock	44 00	

Traveling Expenses	11 86	
Buildings and Land.....	194 10	
Contingent Expenses	20 00	
Balance on hand.....	8,840 53	
	<u>\$23,962 98</u>	<u>\$23,962 98</u>

ADAMS FUND.

1919.

Jan. 1.	To	Balance on hand.....	\$8,695 60
		United States check for quarter.....	3,750 00
Apr. 1.	To	United States check for quarter.....	3,750 00
July 1.	To	United States check for quarter.....	3,750 00
Oct. 1.	To	United States check for quarter.....	3,750 00
Dec. 31.	By	Salaries	\$9,514 56
		Labor	3,598 63
		Postage and Stationery.....	93 64
		Freight and Express.....	31 42
		Heat, Light, Water and Power.....	351 32
		Chemical Supplies	243 62
		Seeds, Plants and Sundry Supplies..	110 64
		Fertilizers	44 00
		Feeding Stuffs	1,697 01
		Library	7 80
		Tools and Machinery.....	289 07
		Scientific Apparatus	18 72
		Live Stock	136 69
		Buildings and Land.....	207 79
		Contingent Expenses	6 29
		Balance on hand.....	7,344 40
			<u>\$23,695 60</u>
			<u>\$23,695 60</u>

EXPERIMENT STATION—MISCELLANEOUS FUND.

1919.

Jan. 1.	To	balance on hand.....	\$2,179 26
		Department Sales	5,074 40
		Department Service	193 61
		Interest	120 53
Dec. 31.	By	Salaries	\$725 90
		Labor	1,341 10
		Postage and Stationery.....	63 89
		Freight and Express.....	333 67
		Library	56 20

Tools and Machinery.....	939 03	
Feeding Stuffs	894 38	
Chemical Supplies	60 77	
Fertilizer	211 00	
Heat, Light, Water and Power....	552 72	
Live Stock	49 85	
Traveling	239 82	
Publications	614 30	
Buildings and Land.....	88 50	
Seeds, Plants and Sundry Supplies..	393 32	
Contingent Expenses	40 90	
Furniture	5 40	
Balance on hand.....	957 05	
	<hr/>	
	\$7,567 80	\$7,567 80

SUMMARY, EXCLUSIVE OF EXPERIMENT STATION, STATE REPAIRS AND
IMPROVEMENTS, AND STATE BUILDING.

Total income including balances:

United States—1890	\$74,422 55	
United States—1862	2,500 00	
United States—1914	17,576 63	
	<hr/>	\$94,499 18

State:

Maintenance	45,000 00	45,000 00
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Institution:

Current	35,461 98	
Trust	64,905 24	
	<hr/>	100,367 22

\$239,866 40

Total Expenditures:

United States—1890 ..	\$52,020 60	
United States—1862	2,500 00	
United States—1914	11,311 35	
	<hr/>	65,831 95

State:

Maintenance	45,000 00	45,000 00
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Institution:

Current	44,898 84	
Trust	64,613 09	
	<hr/>	109,511 93

220,343 88

Balance \$19,522 52

Balance held as follows:

Morrill Fund—1890	\$22,401 95
Smith-Lever Fund—1914	6,265 28
Trust Fund	292 15

\$28,959 38

Current Fund Deficit.....	9,436 86
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\$19,522 52

I hereby certify that the above is correct and true, and truly represents the details of expenditures for the period and by the institution named.

R. S. BURLINGAME,

Treasurer.

This is to certify that we, the undersigned, auditing committee of the Board of Managers of Rhode Island State College, have examined the accounts of R. S. Burlingame, treasurer of the said College, and find the same correct.

THOMAS G. MATHEWSON,

CHARLES ESTES,

Auditors.

REPORT OF EXTENSION SERVICE FOR YEAR 1919.

PRESIDENT HOWARD EDWARDS,
Rhode Island State College:

DEAR SIR:

I beg to submit herewith my report of the Extension work for 1919, the sixth year since the enlargement of the work under the Smith-Lever Act, and the seventeenth year since the establishment of Extension work under a separate department at the Rhode Island State College.

The general plan of the Extension work of the College for the year 1919 has been the same as that of the previous year. We are co-operating with the States Relations Service of the United States Department of Agriculture in four projects, viz: No. II, County Agent Work; No. III, Home Demonstration Work; No. IV, Boys' and Girls' Club Work, and with the Bureau of Animal Industry and the State Board of Agriculture in the employment of a State Dairy Specialist, Project No. VII.

The declaration of an armistice in the World War and the virtual close of the war as a result put an end to the special program of increased agricultural production and intensive food conservation under which Congress had appropriated considerable sums to the Department of Agriculture for use in promoting the required work in the different states. For a time it was hoped that Congress might continue appropriations for such work as was clearly useful on a peace basis and by which each state would be able to maintain a broad foundation of Extension work, sufficient to take care of its most pressing needs. The heavy, and in some cases lavish expenditures by various federal departments during the war, however, called for a program of retrenchment, so that all special appropriations were withdrawn, and the work inaugurated with Federal Funds during the war was terminated June 30, 1919. An appropriation to mature

the funds provided for by the Smith-Lever Act was passed and this undoubtedly enabled many of the states to continue their work as developed during the war.

So far as Rhode Island is concerned, the additional funds received in this way are practically negligible,—in fact, owing to the higher cost of all the work, the Rhode Island State College Extension Service is financially far less capable of meeting the needs of a well rounded program for Extension Work in agriculture, home economics and club work than it was in 1914 when the work began under the Smith-Lever Act. At that time we started with a full time State Leader in county agent work, home economics, and club work together with full time specialists paid from College funds in poultry husbandry and agronomy. At the present time we still have the full time leaders in home economics and club work, but only one-third of a worker's time is allotted to county agent work which, in many respects, is the most fundamental project in the national plan for an Extension Service. With the very material financial aid of the Rhode Island State Board of Agriculture and the Bureau of Animal Industry, United States Department of Agriculture, we have succeeded in collecting funds for one specialist in Dairy Husbandry.

CHANGES IN PERSONNEL DURING THE YEAR.

On account of the withdrawal of war emergency funds, the employment of all part-time employees, except club leaders which were to be paid from local funds after July 1, was terminated June 30, 1919, also of the following full-year workers: Mrs. Mabelle A. Frazee, Mr. D. J. Lambert, Miss Esther P. Wold, Mr. Lorenzo F. Kinney, Jr., Miss Sarah H. LeValley, Miss E. Hope Browne, Miss Vera V. Fanning, and Miss Annie S. Hoxsie. Mr. George H. Baldwin was engaged for a short time on College funds, but left on August 15, 1919. Miss Browne has been re-engaged by the Providence County and Southern Rhode Island Farm Bureaus as County Home Demonstration Agent, and Miss Ruth G. Murray, a recent graduate of the Rhode Island State College, has been appointed to a similar position in Newport County. Mr. R. B. Cooley resigned the position as State Dairy Specialist March 1, 1919 to take a similar position with the Massa-

chusetts Agricultural College. His place was taken by Mr. L. W. Lloyd, formerly County Agent of Newport County. Miss Gladys L. Meloche, State Leader of Home Demonstrators, resigned October 1, 1919 to return to the University of Wisconsin for graduate study. This position was filled by the appointment of Mrs. Ida S. Harrington, formerly State Director of Home Economics for Rhode Island under the Food Administration and, at the time of her appointment, Home Demonstrator for Middlesex County, Massachusetts, who will take up her duties on January 1, 1920. Miss Jessie M. Vroom, Clerk, resigned August 15, and this position remained unfilled for the remainder of the year.

OFFICE ORGANIZATION.

Efforts to systematize the office work and especially the filing has been continued, but with rather slow progress towards an effective revision, especially during the past six months. The resignation of Miss Vroom, office clerk, left us more than usually short handed, and the great demand for stenographers of all kinds made it for a time impossible to find a successor with the required training at the wages which we can pay. The fact that the Director's work is combined with that of State Leader of County Agents and State Entomologist entails a large volume of correspondence and other office work. The many and varied tasks incident to these lines make it difficult to attend to all the details connected with each of them, and the help of an efficient office secretary is of great importance. The work, however, is so different from that in which commercial schools train their students that graduates of such schools find it necessary to take quite a little time to acquaint themselves with our routine, with the subjects of our correspondence, and with the vocabularies which we use. Furthermore, since Extension work is new and in process of rapid development, it has been reduced to routine form to a far less degree than commercial work, and the efficiency of a worker depends a good deal on her initiative and her ability to determine what to do under varying circumstances without time consuming directions in regard to details from the person in charge of the work. All other things being equal, we believe that a more extensive fundamental training, such as can be secured through a college course, will be helpful

in enabling a prospective worker in our office more readily to master the details of routine and achieve some degree of efficiency in work where the rules of routine may not exactly apply. To this end we have sought to find, if possible, a college graduate with training in stenography, typewriting, filing, and elementary record keeping, but such workers are not numerous and are promptly employed when they have completed their courses. Correspondence on several occasions with Simmons College, for instance, has invariably brought the reply: "We regret to say that we know of no graduate who is not now employed."

NEW EQUIPMENT.

Only a few additions to our equipment have been made. Three new letter files have been purchased, one for each of the following workers: the State Leader of Home Economics, the Club Leader, and the Director. A chart and blue print file, a mimeoscope to facilitate drawing work on dermatype stencils, and a portable projection apparatus for lantern slides made by the Spencer Lens Company have also been purchased. The mailing machine purchased last year, while not perfect in its operation, has been a great labor saver, and when our filing clerk has had an opportunity to complete, thoroughly classify, and arrange our address plates, it will be a great convenience and a time saver, not only to our work, but also to any department in the institution that may desire to send out mail to any large group of persons within the state.

CONFERENCES.

During the war time while we had a large number of employees, frequent conferences of all workers were held to coordinate our efforts and keep everyone informed as to the progress of the work. These conferences are important and will be held in the future as often as it seems feasible. Special conferences of County Agents, Home Demonstrators, and Club workers have been held from time to time.

A special conference of representatives of the farm bureaus, the College, and the Department of Agriculture was held in Providence last January. The president of each farm bureau and three

other members of his executive committee designated by him were invited by the President of the College to attend the meeting, also members of the College Board of Managers, and a representative of the United States Department of Agriculture. Further notes on these conferences will be found under reports in the respective projects.

CAMPAIGNS AND SHORT COURSES.

Several special campaigns were carried on by the home economic workers. One of these, a milk campaign in the City of Newport, was organized with a great deal of care and thoroughness. Expert assistance was secured from the United States Department of Agriculture. The Newport County Farm Bureau was a leading co-operator, and the milk distributors provided the necessary funds. Stores, newspapers, and other agencies gave splendid support.

The Dairy Specialist in co-operation with resident teachers in the Animal Industry and Agricultural Departments of the College and the County Agents conducted a four-day dairy course during the Christmas recess, which although like similar efforts in the past was not largely attended, nevertheless, seemed to be well received by those who came. All three of the farm bureaus conducted membership campaigns during the year through which an increase in membership of about 200 per cent. was secured. The Newport County Farm Bureau also conducted short courses in two places in the county.

PUBLICATIONS.

There has been published during the year one bulletin, entitled, "The Hot School Lunch," which has been used in connection with project No. III. A bulletin on hog raising has been written by Mr. Lloyd and published by the Rhode Island State Board of Agriculture. Five numbers of the Extension Review have been issued. It was originally intended to make this a monthly publication, but the withdrawal of Federal Funds and the consequent reduction in our corps of workers has thrown so much work on the remaining ones that it is impossible to carry this plan through. The reduction in our funds also necessitates greater economy in expenditures for printing.

The Farm Bureau News, started last year, had a successful year and fills an important place in farm bureau work. The County Agents are the editors for their districts, and the general editing, proof reading, and management of the printing and mailing was supervised first by the Dairy Specialist, then by the Assistant County Agent at Large, and since August it has fallen to the lot of the State Leader of County Agents. An annual report of the Extension work is prepared and printed as part of the report of the Board of Managers of the State College. Our chief method of disseminating information is through mimeographed circular letters, and press notices. Each line of work issues a considerable number of these letters throughout the year.

EDUCATIONAL EXHIBITS AND LECTURES.

The Extension Service, in accordance with the practice of the last few years, has supervised the preparation and staging of the Rhode Island State College exhibits at the county and local fairs. At the suggestion of this office the Washington County Fair Association granted the College space this year in Hazard Hall, a building hitherto used almost solely for a general meeting of about an hour's duration, on Thursday of Fair week. The walls, and space around the hall sufficient for a table or bench, with the exception of one corner which was occupied by the State Board of Health, was allotted to the College, and made possible the effective staging of a much larger exhibit than the College has had in previous years when space was assigned in the main exhibit hall. As in past years the exhibit shown at the Washington County Fair was divided, and the sections sent to the Newport County and Providence County Fairs. Parts of the exhibit were later on sent to Fairs at Fiskeville, Shawomut, Anthony, and Ashaway.

Our Extension workers were called on to judge at the county and local fairs. Extension workers have been frequently called on to give lectures and demonstrations at fairs and before granges, men's clubs, women's clubs, and other organizations. The staff at the college, including the Extension Service, the Experiment Station, and the resident College teachers, co-operated with the Newport County Farm Bureau in holding Extension Schools in Middletown and Portsmouth, and with the State Board of Agriculture in its institute work.

FINANCES FOR YEAR 1920.

The principal support of the Rhode Island State College Extension Service comes from Federal sources, and the amounts for the past year were as follows:

I. Regular funds of the College and the United States Department of Agriculture—

Smith-Lever funds for the federal fiscal year ending June 30,	
1919	\$10,764 10
State Smith-Lever funds for same period.....	764 10
Supplementary College funds.....	262 80

II. Federal funds allotted to Rhode Island from the regular appropriations to the Department of Agriculture for the federal fiscal year ending June 30, 1919 and available only for salaries—

County Agent work.....	\$3,001 00
Club work	2,400 00
Home Economics	600 00

The Bureau of Animal Industry, United States Department of Agriculture, also co-operated to the extent of \$1,000.00 toward the salary of a dairy specialist. The Board of Agriculture and College each contributed \$750.00, and out of this total of \$1,500.00, \$500.00 is set aside for traveling expenses.

III. For the federal fiscal year ending June 30, 1919, there were available for work in Rhode Island the following amounts from war emergency appropriations—

County Agent work.....	\$3,900 00
Home Economics	10,200 00
Club work	5,500 00

It should be said in regard to these emergency funds that as far as the year 1919 was concerned, they were of little benefit to us. Earlier in the year it looked as though they might be replaced at least in part by permanent appropriations, and plans for utilizing the remainder of the emergency funds were made and started accordingly. Later in the season it became practically certain that appropriations would be cut down to the pre-war basis, and the work started had to be very largely abandoned.

Since July 1, 1919 there has been added to the regular Smith-Lever appropriations \$181.93 which has to be met with a like appropriation of state money. With the passage of the resolution providing for a maturing of the Smith-Lever funds, there accrued to the state another sum of \$545.79 which, with what has been allotted to the state in past years, makes a total of \$1,491.82 of

Smith-Lever funds which must be met with a like sum from state appropriations, so that the Smith-Lever funds for 1919-1920 stand as follows:

Federal Smith-Lever	\$11,491 82
State funds to meet the additions to the original \$10,000 allotted to Rhode Island.....	1,491 82
From Federal funds administered by the United States Department of Agriculture and available for the fiscal year ending June 30, 1920, we have allotted for—	
County Agent work.....	\$3,300 00
Home Economics	2,700 00
Club work	2,100 00

THE AFTERMATH OF WAR EMERGENCY WORK.

In passing it may not be amiss to record briefly our experience with Federal Emergency appropriations. These were first planned in the spring of 1917 after the declaration of war, but owing to delays in Congress bills providing the funds did not pass until August 10, 1917 when it was too late to do any effective work in agricultural production for that year. The following year while funds were definitely fixed up to June 30, and while continuing resolutions after July eventually maintained the funds allotted to the states at the same level as at the close of the previous fiscal year, there was considerable uncertainty throughout the entire season as to just what Congress would finally do with the appropriations. The matter was not settled until late in November after the armistice had been signed, and the war was considered virtually at an end. At this time, and even before Congress passed the appropriation bills for the year, a new uncertainty arose as to whether Congress would appropriate money for a continuance of any of the work the following year.

These uncertainties kept the emergency extension workers in all lines wondering whether it was safe to plan on a continuation of the work or whether they must look for other employment. Leaders were constantly confronted in their own minds and from various other directions with the question, "Is it worth while to take up this or that line of work if it must be abandoned before it can be completed?" and much of the value which the funds should have been to us was therefore lost.

Another source of perplexity in our field as well as in other lines of war work was the difficulty in obtaining adequately trained workers. In fact, because work in agriculture and home economics had less of the spectacular and appealed less to patriotic fervor, it probably had a greater scarcity of trained workers than any other important line of war work.

There was also some confusion due to the onrush of individuals and organizations into fields where they had never worked before, and this made it more or less of a problem for those regularly in the service to adjust their plans to the new situations as well as to the permanent needs of the work.

In many states where the supplementary Smith-Lever appropriations, matured by congressional action last year, took the place of Federal Emergency funds and where accordingly they have been able to save and maintain the best of the work built up during the war, the results on the whole have no doubt been gratifying to those interested in agricultural extension work. Many states, however, and Rhode Island is one of them, are very much in the position of a poverty stricken individual, who is suddenly endowed with wealth and then almost before he is sure that he has it, and can make effective use of it, he is as suddenly deprived of the funds and left as indigent as before with the added onus that he did not seem to know how to take advantage of his opportunity.

The situation is not, however, without some items of satisfaction. In such lines as could be developed under the uncertainties which existed, we were able to accomplish work which we had reason to believe was successful at the time and the effects of which will be felt in the future. This was especially true in the Food Conservation work which could go on at all times and in which we were able to develop full co-operation with other organizations interested and especially with the Food Administration. The club work with boys and girls also accomplished a great amount of good along this line. The lessons in the saving of food and in general thrift given to both adults and children will no doubt have results which, could they be measured in dollars and cents, would give the people of the state a more comprehensive idea of the value of extension work.

The farm bureau work of the state although it has been and is suffering from the general public apathy toward agriculture and has been the butt of a good deal of criticism, is probably also in better favor than it would have been, had it not been for the special services which the county agents and home demonstrators were able to render during the war.

ACKNOWLEDGMENTS.

It is a pleasure to record acknowledgment to the College authorities, and especially to President Edwards, for their continued interest in the work and assistance in maintaining the Extension Service under conditions that have been trying both from the financial and other standpoints. As in the past we have had valuable assistance rendered by resident professors and instructors of the College and Experiment Station, which is greatly appreciated, especially in view of the fact that they are fully occupied with their own work, and therefore able to give but very little time to matters outside of their regular duties. The representatives of the Federal Department of Agriculture and especially those connected with the States Relations Service, have continued to aid us in many ways with suggestions as to how to surmount the difficulties in organization and methods with which we have met, and for this assistance we are duly grateful.

It is also most gratifying to state that at no time since the establishment of the farm bureaus have we had so many evidences of the fact that the farm bureau officials and the agents employed co-operatively with the farm bureaus are realizing the essential importance of having all agencies interested in agriculture and home economics working together. As a result of this favorable attitude, many sources of misunderstandings have been cleared up, and we may look forward to much greater efforts in achieving still better team work in the future. For these evidences of a hearty inclination to subordinate, what in some cases might have become a mistaken effort to advance imaginary personal interests, to a real effort to co-operate with every agency whose purpose it is to promote rural welfare, the Director is sincerely grateful.

PLANS FOR THE FUTURE.

For the best results, it would seem that we should lay our plans

with two objects in view; first, to meet the most pressing needs for the next year or two, and second, to anticipate so far as we can foresee at this time the requirements of a well rounded constructive program of extension work in agriculture and home economics for Rhode Island which shall eventually help to give rural life and vocations their proper and rightful place in the social and economic development of the state.

Because of its newness and the vigorous growth of extension work, as well as on account of the rapid changes which agricultural science in general is undergoing, it would be the work of a real prophet to foresee definitely what should be done to promote Rhode Island agriculture even for a year or two in advance. This fact should not, however, lead us to neglect the importance of formulating as definite plans as possible. Fortunately, and unfortunately, there are a large number of states well supplied with funds for extension work which are doing pioneer work in the extension field. Fortunately, because the success or failure of their methods helps point the way to us in making our plans here; unfortunately, because we are constantly importuned by our own desires to keep up with the procession and the urgent requests of the people of the state to render to them the same service provided by the more liberally supported Extension Services, to undertake work which we cannot for lack of trained workers carry out successfully, and to spread ourselves over so much ground that none of our work can measure up to a reasonable standard of efficiency.

For the immediate future we must work for a more effective realization of team work and unity in our extension plans. To this end it is urgently needed, that we should study results of work in other states where success is being achieved and that we should well consider the recommendations from the States Relations Service in Washington whose workers, while they do not know our own conditions so well as we do, nevertheless, have an excellent opportunity to see our problems in the light of the experience in other states and to give us valuable advice as to methods of solving them.

Extension work is now assuming definite shape as an endeavor; first, to organize people of the different rural communities of the state for self help; second, to aid them in determining what their community needs are; and third, to so guide the local forces that

they can co-operate with trained extension workers in agriculture and home economics in meeting these needs. It must—and here it avoids the field of the Smith-Hughes work—therefore primarily work directly through the homes rather than through established educational channels, and by means of organization and demonstration of methods in co-operation with all the members of the home. Experience in other states and the conclusions of those who have had wide experience in the matter seem to indicate that this is in the long run best accomplished by working as far as possible through the farm bureaus, and I believe this plan of conducting our club work as well as our home economics and general agricultural work should be given careful and definite consideration in the near future. Club work carried on in co-operation with the two other main lines of farm bureau work can give to them as well as receive from them a tremendous amount of help, and much of the success of all our work depends on how effectively the three lines can be coordinated.

Whether we are planning for the immediate future or endeavoring to develop a long term program, we must first try to determine what are the most important lines of extension work needed to promote agriculture and home economics in Rhode Island. This should form an outline of work from which we can select and develop those projects that are of most pressing importance and that we have the facilities to carry through to a successful conclusion. Without a clear-cut outline of what needs to be done, we are liable to flounder around more or less aimlessly and perhaps to greatly emphasize projects of less importance than others which we do not take up at all. This program should be carefully worked out in co-operation with the community and other committees of the farm bureaus, the farm bureau agents, the resident workers of the State College, the Board of Agriculture, and with such other agricultural organizations as may be interested, as well as with progressive, broad-minded citizens of the state who have an interest in rural life and occupations whether they live and work in rural communities or not.

Another subject which should receive attention is the relation of resident workers at the College and Experiment Station to the Extension work. Under our present circumstances the Extension Service is handicapped to a considerable extent for want of that

authenticity and up-to-dateness in the information given out which, with the present extensive development and ramification of agricultural science and practice, can only come from subject matter specialists. Our county agents and our leaders may have specialized to some extent along certain lines and may in some degree be considered authorities along these lines, but they must become more and more specialists in organization rather than in agricultural or home economics subject matter. And any one who will try in these days to keep up with developments in rural organization and the literature relating thereto will soon find that he has not much time for concentration and specialization on other subjects.

We realize that resident teachers and workers of the College and Experiment Station are very busy with their own work and can give but little time to extension problems, nevertheless it would seem that for the good of the institution as a whole and until we can have to a larger extent than at present, and, as is now the rule in extension divisions in other states, specialists who can have a definite connection with the subject matter departments and at the same time be free to carry their message out over the state, the members of the resident staff should from time to time meet with our extension workers to aid them in subject matter problems. It would seem from past experience that this cannot be accomplished in a wholly satisfactory manner unless we establish a more explicit plan for such relationship than we have had in the past, and I would respectfully suggest that this matter be taken up with a view of formulating an official plan by which we may be guided.

The past year has marked quite a noticeable progress in the establishment of more effective co-operation between the College and the farm bureaus. The farm bureau officials, the county agents, as well as other extension workers have a clearer conception of their interrelationship, and, as is nearly always the result of a better mutual understanding, we have arrived at a middle road along which we can all travel toward the common goal. Among the various things which require attention this year are the following: All three bureaus need more local support, and considerable effort on the part of all concerned must be expended in securing it. The county agent's function and the methods which

he must follow in order to do effective work are not yet fully understood by all the farmers. He is still regarded by many as a sort of farm doctor and is expected to accomplish the wholly impossible feat of visiting and advising from 1,000 to 2,400 farmers a year, besides attending to a thousand and one other duties in office and field. A few others look upon him as a sort of farmers' secretary and business agent, conveniently provided through the College and United States Department of Agriculture, and supported by public funds to transact such affairs for farmers who have "discovered him," as they may find it inconvenient to do themselves or which they may be unable to perform. There is as yet an insufficient number of people who are far-sighted and broad-minded enough to recognize his primary function as an assistant, guide, and teacher in organizing communities for self-help and in placing these communities in contact with the sources of information which they may need in working out their own salvation. Considerable educational work must therefore be done by leaders, agents, and farm bureau members who have studied the matter before we can most effectively utilize the agents' time and the public funds appropriated for farm bureau work.

Education along this line is also necessary in order that we may secure a place in the public mind for farm bureau work, along with other educational enterprises and obtain financial support for it from individual or public sources on the basis of public welfare, and the good it will do for the county or state as a whole, rather than on the basis of some immediate and direct pecuniary benefit to the individual farmer or farm bureau member.

WORK WITH PROJECTS.

PROJECT I.

This project, which is very general, embodies the supervision of the different projects, expenditure of funds, auditing bills, rendering of reports to the College and the United States Department of Agriculture, etc., requires no special report since an account of most of the work has been presented in the preliminary outline already given. It may be added, however, that much of the miscellaneous work of the Extension Service, for which we now have no project and no other worker who can give it attention, falls to the lot of the Director. Most of this work consists of corres-

pondence in answer to inquiries and at certain seasons of the year requires considerable time. Inquiries which no one in the Extension Service can answer satisfactorily are referred to subject matter departments of the College. The Director's time is divided as stated in previous reports as follows: one-third being devoted to the supervision of the work of the Extension Service and general correspondence, one-third to county agent work, and one-third to the work of the Board of Agriculture.

PROJECT II. *County Agent Work.*

In the Southern Rhode Island Farm Bureau District, County Agent Comins has specialized in dairy improvement. Among the specific advances made through his efforts may be mentioned the introduction of fifteen registered males and seventy-one registered females besides seventeen high-grades. Two cow testing associations have been organized. One is already doing active work, and the other is waiting for final organization and for a satisfactory tester. Many demonstrations have been conducted to show the value of legumes especially of clover, hay and silage in connection with the feeding of dairy cattle. Several silos have been constructed, and there has been a considerable increase in the number of acres of clover grown. The co-operative organizations started last year are flourishing and are increasing both in membership and in financial support.

In Providence County, Assistant County Agent Hawes has also stressed dairy improvement. Quite a number of pure-bred dairy cattle have been introduced and several demonstrations in better feeding, home mixing of grains and home growing of silage and other roughages have been held with good results. Considerable time has been given in encouraging co-operative organizations and the purchase by them of lime and fertilizers. During the fall an effort was made to interest a number of organizations centering in Providence County in holding a combined show and in obtaining the use of the Providence Armory for the purpose. Plans for a cow testing association in Providence County are under way, also the establishment of a co-operative dairy in Bristol. A membership campaign increased the membership of the farm bureau 125 per cent.

County Agent Hollis of Newport County has emphasized seven definite lines of work which include dairy improvement, poultry culling and caponizing, crop improvement, farm accounting, co-operative buying, farm bureau organization, and general live stock improvement. Along dairy lines, he has organized a bull association with five blocks which have each purchased a pure-bred Holstein bull. A newly organized cow testing association is now actively at work and the tester employed in addition to weighing the milk is helping the county agent drive home the importance of better and more economical methods of feeding through the use of home-grown silage and legumes and home-mixed grains. A great many poultry culling demonstrations have been held, and one of them has been organized to follow up the results throughout the year with monthly reports from the best birds and the culls. The reports are published in the Farm Bureau News and constitute one of the most definite and clear-cut records of results to show the value of county agent work which we have had. A farmers' exchange has been organized and through this has been purchased a considerable quantity of grain for the feeding of dairy cattle. In order to improve the marketing conditions there has been organized a branch of the New England Dairymen's Association, which through co-operation with the Aquidneck Dairymen's Association will be helpful in stabilizing the marketing of milk in Newport County. Newport County also took a leading part in conducting a campaign for the use of more milk in the City of Newport. While this campaign was undertaken in part to stimulate greater use of milk especially when there is a surplus and when consequently it is low in price, by far the most important purpose was to teach the consumers in the city the absolute importance of milk in feeding children and that it is, even at the higher prices now prevailing, a relatively cheap food. The results along this line are far reaching and the value of this work alone will more than justify the maintenance of the farm bureau in Newport County.

PARTIAL SUMMARY OF THE WORK OF ALL AGENTS.

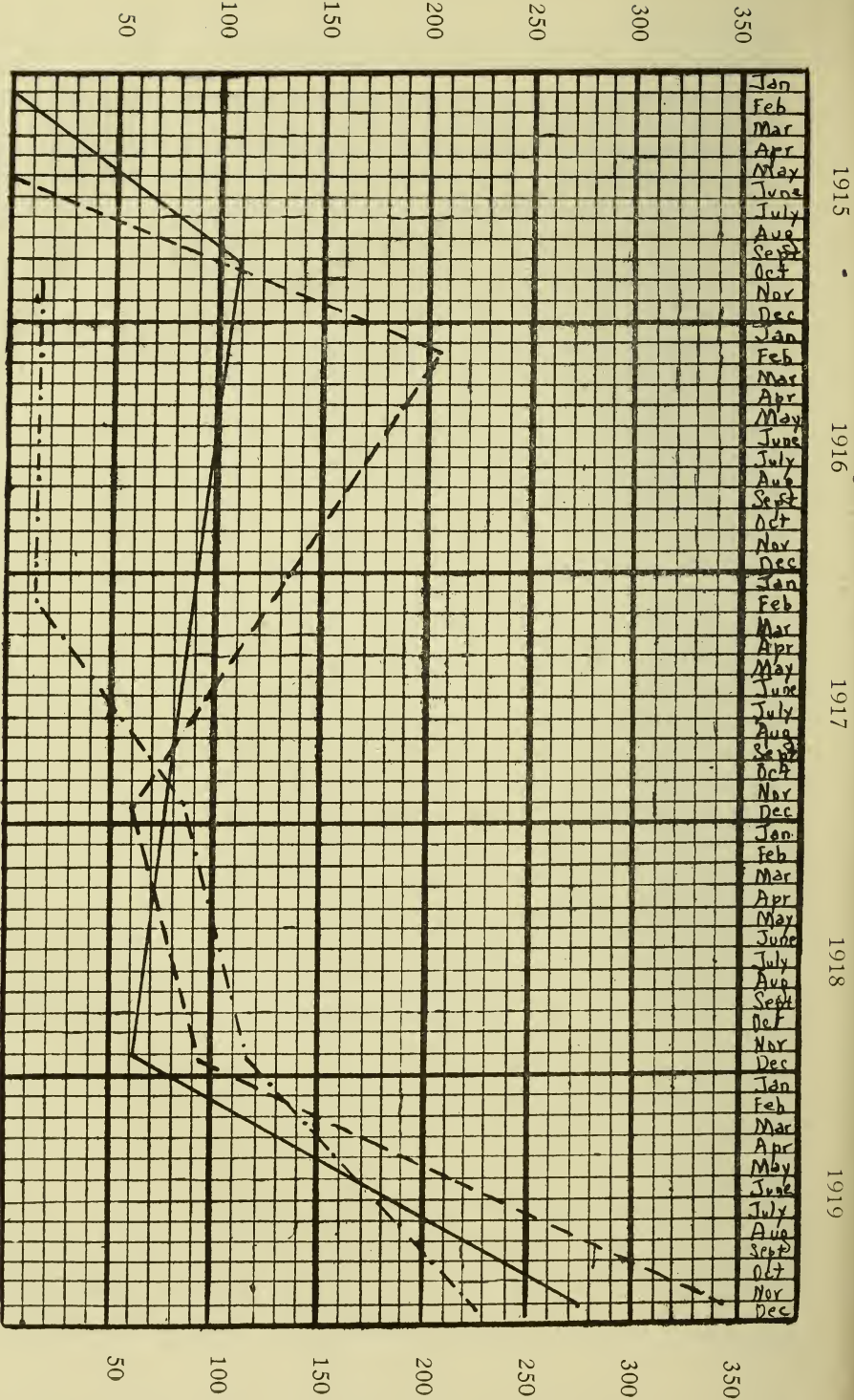
Different farmers visited on their farms.....	420
Total number of farm visits made.....	1,042
Calls on agents at office.....	1,718

Meetings held under auspices of organizations or agents.....	205
Total attendance at such meetings.....	3,278
Membership in County Farm Bureaus, Nov. 30, 1919.....	852
Increase in membership during year.....	584
Boys' and Girls' Clubs organized in 1919.....	1
Total membership in such clubs organized in 1919.....	9
Agricultural articles written by Agents for Farm Bureau News....	108
Agricultural articles written by Agents for Local Papers.....	122
Letters mailed	3,021
Total circulation of circulars and circular letters.....	11,933
Local extension schools and farmers' institutes at which Agents as- sisted	3
Days devoted by Agents to above schools.....	5
Total enrollment at such schools and institutes.....	253
Agricultural observation parties conducted.....	5
Total number of persons at such parties.....	27
Meetings or demonstrations held with specialists.....	28
Days leave	17½

GROWTH IN MEMBERSHIP IN THE FARM BUREAUS.

One of the significant and gratifying indications of interest in the farm bureau work has been the activity of the farm bureau workers in increasing the membership in the different bureaus. Up to this year such attempts as have been made to secure and hold members have been more or less desultory, but this year they were conducted systematically and the farm bureau officials and committees did splendid work. The following diagram will show the results of this development in a striking manner.

Explanation of the lines in the diagram:—A solid line ——— indicates growth in membership in Southern Rhode Island District; dashes - - - - - growth in the Providence County District; dash and dot — . — . — . growth in the Newport County District.



PROJECT III. *Home Economics Work.*

Under the efficient direction of Miss Meloche five definite projects were carried on by the home demonstration agents; namely, organization, clothing, foods, mothercraft, household conveniences, and household budgets.

A school of instruction in organization was conducted at Kingston at the close of the past fiscal year under the direction of Mr. Simons and Miss Sarah Pettit of the Washington office. The county agents and the home demonstration agents then proceeded to organize community committees and prepare for membership campaigns in their own counties with the result that preliminary organizations were effected in all the communities of the Newport County, in four communities of Southern Rhode Island, and two in Providence County. Unfortunately the repeal of the Federal Emergency demonstration appropriations broke up all effective follow-up work in connection with these local organizations.

The subject of clothing aroused considerable enthusiasm among the women. The greater part of the work was carried on through Mothers' Clubs, but groups of mill girls were taught simple sewing, and groups of neighborhood women met at the various homes to remodel old garments or renovate last season's hats. Most of the garments made over for adult wear were of woolen materials such as suits, coats, skirts, trousers, and old-fashioned capes. Linen and cotton garments which were still in good condition were remodeled into children's clothes. The most popular topic that was discussed among the women was "General Thrift in Clothing" which included suggestions for selecting, cleaning, renovating, and remodeling old hats and garments.

The former "Hoover Hut" in Providence was taken over by the Civic Welfare League and in co-operation with the Women's Committee of this League, an exhibit of "salvaged" children's garments was displayed. The exhibit was scheduled for two weeks, but on account of the keen interest shown, it was voted to continue the demonstration for five weeks. The cottage was open from 10 a. m. to 5 p. m. and there was always present a paid or volunteer worker who explained to the women visitors the manner in which the garments had been remodeled. In some cases, the women who remade garments in classes loaned them for this exhibit, and later

to the Women's Club in Barrington, and still later to the Child Welfare Department in Newport.

When the Food Administration went out of existence January 1, 1919, interest in food conservation began to lag until several campaigns were organized with a view to arousing the interest of the public in the value of foods, particularly that of milk. One campaign was carried on in co-operation with leaders in the Y. W. C. A. in Pawtucket where the Home Demonstration Agent gave short five to fifteen minute talks on "Food for the Body" to working girls in practically every factory. Two other campaigns were organized, one to aid market gardeners in selling their surplus vegetables and another a milk campaign which was staged in Newport. The sum of \$350.00 was secured from milk distributors and dairymen to carry on the Newport campaign. A committee consisting of Mr. Hollis, County Agent, Miss Hoxsie, Home Demonstration Agent, Mr. Lloyd, Dairy Specialist, the State Leader of Home Demonstration Agents, and Mr. Coggeshall, treasurer of the Farm Bureau, was appointed. Literature on the value of milk, advertisements of diverse kinds, speeches made by prominent speakers in the schools and factories, and exhibits in store windows were used as a means to carry information on the food value of milk to the public.

The Mothercraft project was continued until July 1, 1919 when the Emergency fund gave out. Interest was shown in this organization not only by mothers, but by the District Nursing Association, Organization of Charities, and Directors of the settlement centers as well. Although it was necessary to drop the regular city work, the district nurses in the rural sections will co-operate with the home demonstration agents of the farm bureaus.

The use of household conveniences such as the sewing machine and its attachments, fireless cooker, double-boiler, egg beater, and spatula have been stressed in many classes. Household accounts proved to be an interesting subject to women and when the College recommends a simple household account book, no doubt many women will be ready to make use of one.

PROJECT IV. *Club Work.*

With the discontinuance of the Emergency funds from the United States Department of Agriculture on July 1, 1919, the work of

three assistant leaders and some of the local leaders was terminated. According to agreements for co-operation with a number of school organizations they were to maintain after July 1 the work of certain local leaders who up to that time had been paid from Federal funds and this afforded some help to the State Leader, Mr. Thomas, but not enough to continue all the work that was started earlier in the year with the same efficiency that was secured last year.

The following club projects have been conducted during the year: corn, potatoes, gardens, canning, poultry, pigs, baking and cooking, sewing, handicraft, and rabbits. A few boys have been interested in keeping bees, goats, and guinea pigs.

The total enrollment in the spring was 487 clubs with approximately 10,000 members in all club projects. Many more boys and girls have engaged in the work and received the instruction, bulletins, etc., but have not enrolled as club members.

According to the report of the state club leader, the lack of sufficient help to get in the reports of the club workers in the fall, resulted in getting reports from only 60 per cent. of the total enrollment as compared with 86 per cent. the previous year. The total value of products of those who reported is estimated at \$75,108.25, and the average value per club member reporting is \$14.00.

Through the generosity of Governor Beeckman, twenty-six boys and girls from Rhode Island were sent to the Eastern States Exposition held in Springfield, Massachusetts, in September, 1919 to compete with teams from other states in the judging contest. These boys and girls were sent primarily for the educational benefits they would derive therefrom, and had not been coached so strenuously as those from other states, although they had received some suggestions on judging from Mr. Lloyd, Dairy Specialist, Mr. Hawes, Assistant Agent, Providence County, Mr. Comins, Agent, Southern Rhode Island, and Miss Currier of Pawtucket. Prizes won were as follows: Exhibits, two first, one second, two third, one fourth; Judging Cattle, second; Poultry, second; Pigs, third; Sheep, second; Garments, third; Bread, third; Potatoes, fourth; Handicraft, fourth; Corn, fifth; Vegetables, fifth; Canning, sixth.

The following statistics help to show what members of clubs

have done in agricultural and home enterprises, and in the acquirement of thrift: 30% owned Liberty Bonds, 80% owned War Savings and Thrift Stamps, 50% owned Bank Accounts, 7% owned five pigs, 19% owned eight calves, cows, or baby beeves, 42% owned 584 birds (poultry), 7% owned household or kitchen furniture, 11% owned automobiles, 30% were in first year club, 26% were in second year club, 26% were in third year club, 7% were in fourth year club, 42% attend grammar school, 50% attend high school, 7% are not in school, 50% intend to go to college, and 15% are officers of their home clubs.

PROJECT VII. *Dairy Extension.*

This project is our most recent one and Mr. Lloyd, who is now in charge, has been at work less than nine months.

For a number of years Rhode Island dairy men have been contending against three conditions very detrimental to further development in their business, namely: inadequate prices for their products, low producing cows, and too high cost of feeding. There are, however, fairly good prospects for carrying on a profitable dairy business in Rhode Island, because of the excellent opportunities for marketing, if these opportunities are developed in the right way. We have a population of 600,000 people and less than 25,000 dairy cattle. Assuming that 4,000 pounds of milk per cow per year are produced and that each inhabitant is allotted one pint, we must conclude that less than one-half of the milk consumed by Rhode Island people is produced in the state. We believe that we can supply all the milk needed at the present rate of consumption without materially increasing the number of cows, simply by getting dairymen to keep better cows and pursue better methods in dairy practice.

The dairy specialist has addressed himself primarily toward arousing interest in overcoming the three main obstacles mentioned above, and considerable progress can be recorded. It is the specialist's function to develop his work in co-operation with the county agents' and to work with them so far as possible in carrying out the dairy projects. Results of the dairy work have therefore already been enumerated more or less fully under Project II. and it is only necessary here to mention briefly the things with which the dairy specialist has been connected.

Under dairy marketing, assistance has been given in stimulating an interest in the local organizations of the New England Milk Producers' Association. The specialist has kept in touch with the co-operative dairies which have been organized, and has assisted them in every way possible. The co-operative dairy associations in the organization of which the county agents or dairy specialist have been interested are doing well.

The specialist has co-operated with the home economics workers and the farm bureaus to give the public a better understanding of the value of milk as a food and of the fact that there can be different grades of milk which must be sold at different prices. In this way it is hoped to get the consumers to use more milk and to recognize and purchase high grade milk with a larger proportion of butter fat, if they want it, and pay correspondingly higher prices than for milk produced under unsanitary conditions and with a lower butter fat content.

Improvement of the dairy stock has been given a great deal of attention during the year and the county agents have been aided in their efforts, to introduce better sires and to encourage the raising of calves from high producing parentage. In this connection there has been a great deal of work in organizing cow testing associations for the purpose primarily of calling attention to the fact that many dairymen are keeping cows which do not pay for themselves. Two of these associations are now in operation and prospects are favorable for the organization of two others in the near future.

The high cost of feeding has been attacked in various ways. Efforts have been made to show dairymen the importance of using roots and silage, and of growing alfalfa, clover, soy beans, and other legumes high in protein in order to save on grain bills. The importance of balancing rations and of mixing the rations, after a careful study of the market prices of feeds, has also been emphasized. Brief direction for mixing rations based on market prices for available feeds have been prepared in co-operation with the professor of Animal Industry at the College and sent out each month with the Farm Bureau News.

Poor pastures are a big factor in increasing the cost of milk production, and efforts to interest dairymen in pasture improvements have been made.

The co-operative wholesale purchasing of feeds has also been encouraged, and advice given as to what feeds are most economical at the prices quoted from time to time.

The federal campaign to eradicate tuberculosis has been vigorously supported. The plan has been explained, and farmers have been aided in complying with provisions necessary to get their herds on the accredited list. Sanitary measures intended to facilitate the elimination of tuberculosis and also of contagious abortion have been promoted.

While not a part of the dairy project, the raising of hogs and sheep has been given some attention. Favorable prices during the war created an interest in the raising of both hogs and sheep and there was a considerable increase in the number of animals raised. Recent prices have been a damper especially on the raising of hogs, but it is still important to stimulate the raising of both hogs and sheep in so far as they will enter into an economical system of farm management. To this end advice has been given in regard to the importance of better stock, pure bred sires, better housing and sanitation, home grown grains, pasturage, balanced rations, wholesale purchase of grains and greater economy of labor through the use of self-feeders.

As a means to create an interest in the work under this project, and to teach various lessons connected with the work, exhibits were prepared last fall and staged with the other exhibits of the Extension Service at the various county and local fairs. The specialist acted as judge at many of the fairs and assistance has also been given to the Club Leader in connection with live stock judging contests in club projects.

Respectfully submitted,

A. E. STENE,

Director.

THIRTY-SECOND ANNUAL REPORT
of the
DIRECTOR OF THE AGRICULTURAL EXPERIMENT
STATION.*

PRESIDENT HOWARD EDWARDS,

DEAR SIR:—I submit hereby, in non-technical language, concise statements of such experimental results obtained during 1919 as will indicate the nature of most of the more important lines of work.

In such a report of progress it should be understood clearly that present ideas regarding the results are liable to modification in the future as the researches are continued. Nevertheless, it seems desirable to transmit annually the impressions which are derived, even if some readers do attach too much importance to certain indications.

PUBLICATIONS.

The publications which have been issued since the last annual report are as follows:

The relation of the lime requirements of soils to their retention of ammonia. *In* Soil Science, 1918, 6, 405-411.

Lime requirements as determined by the plant and by the chemist. *In* Soil Science, VII, 4, April, 1919, (279-283).

Bacteriological notes: (1) Gas production by *Bact. pullorum*; (2) *Bact. pullorum* infections in adult birds; (3) Relation between saccharose fermentation and immunizing power by *B. avisepticus*. *In* Jour. Bact. 1919, 4, 65-69.

The diagnosis of fowl cholera and fowl typhoid infections in domestic birds. *In* Jour. Amer. Vet. Med. Assoc., 1919, 55, 2, 186-192.

Thirty-first annual report of the station. *In* Bul. of Rhode Island State College, XIV, 4 (57-65).

The influence of crop plants on those which follow, II. Bul. 176, March, 1919, 47 pp.

*Contribution No. 267.

The relation of certain acidic to basic constituents of the soil as affected by ammonium sulfate and nitrate of soda. *In Soil Science*, 1918, 8, 4, 313-321.

The value of sodium when potassium is insufficient. *Bul.* 177, April, 1919, 29 pp.

Inspection of Commercial Feeds. *Annual Feed Bulletin*. May, 1919. 12 pp.

A five-year rotation of potatoes, rye straw and squashes, onions, oats and rowen, and hay. *Bul.* 178, May, 1919. 15 pp.

Studies on fowl cholera VI: Immunization against *B. avisepticus* by means of inoculations with killed cultures of virulent and avirulent strains. *Bul.* 179, June, 1919, 15 pp.

The manurial value of a modification of orthoclase-bearing rock where only potassium was deficient. *In Jour. Amer. Soc. Agron.*, 11, 8, 327-329.

Analyses of commercial fertilizers. *Annual inspection bulletin*, October, 1919, 11 pp.

A field comparison of hydrated lime with limestone of different degrees of fineness. *Bul.* 180, Dec., 1919, 20 pp.

Egg-weight as a criterion for numerical production in the domestic fowl. *In Jour. Amer. Assoc. Instr. and Invest. in Poultry Husb.*, 1919, 5, p. 26; *In Jour. Amer. Naturalist*, 53, Sept.-Oct., 1919, 377-393; *In Science*, 49, 1270, 427-429; *In Reliable Poultry Jour.* 26, 6, 567.

Three new bacterial species pathogenic for the domestic birds. *In Jour. Amer. Assoc. Instr. and Invest. in Poultry Husb.*, 1919, 5, 9, 67-69.

Notes on the influence of varying methods and procedures on certain biochemical reactions determined by bacteria. *In Jour. Amer. Vet. Med. Assoc.*, 1919.

WEATHER.

Detailed weather records may be found in the New England Climatological Data of the United States Weather Bureau. The mean temperature in Rhode Island in April, May, June and September was less than a degree below normal; whereas in August and October, it was about 2.5 degrees above the normal. Kingston had the warmest October within the 31 years' record. The last killing frosts here in the spring were April 25 to 27, a minimum of 24° having been reached on the 26th. Not until October 30 did the temperature again drop as low as 31°.

The rainfall of April was normal and that of May, although above normal, was well distributed. Between May 22, when over an inch of rain fell, and June 27 and 28, when there was abundant rain generally, portions of the state had very little precipitation—

at Kingston 1.52 in., at Hope Valley, .99 in. and at Pawtucket, .50 in. The latter portion of this period constituted the only "dry" time in the growing season. At Kingston the rainfall was 5.29 in. in July, 8.33 in August and 7.61 in September; the last two amounts broke the record for these months.

In eight out of eleven days from August 24 to September 3 a total of 7.41 inches of rain fell, just when potatoes needed to be removed from the wet soil where blight was already menacing the crop. The excessive moisture resulted in much loss from rot.

There was no advantage in overhead irrigation of vegetables.

ORGANIC MATTER FOR THE SOIL.

The four winter legumes, which were sown with a little rye after peas in 1918, received winter injury in the following increasing order: red clover, alfalfa, sweet clover and vetch. They were turned under on May 9 as green manure for sweet corn, of which about 7 per cent. more ears by weight were produced after the red and sweet clovers than after the alfalfa and vetch.

Where corn is grown continually and a rye cover crop was plowed in, 48 bushels of corn were produced. Where legumes, instead of rye, have always been used as a cover crop, 44 bushels were produced with less nitrogen. With no cover crop, but otherwise the same as the rye section, the yield was 38 bushels. During the last two years 20 pounds of nitrogen on the legume section have produced about the same amount of corn as four times this amount on the rye section. An attempt will be made to determine by actual experiment the amount of nitrogen to which the legume cover crop is equivalent. Some long cumulative effects up to 1917, as shown by work which is being published in Soil Science, may be observed in the following soil results: Per cent lost by ignition—check plat, 4.37; rye plat 4.54; legume plat 5.07; lime requirements per acre-foot—check plat 3300; rye plat 3300; legume plat 4800.

In conjunction with fertilizer chemicals, peat composted with hydrated lime is being compared with 16 tons of stable manure furnishing the same amount of organic matter. Conditions favorable to the use of peat in connection with the growth of vegetables have not yet been found; evidently the lime must be increased

still more, for the peat is very sour and it has been especially unsatisfactory for the acid-sensitive crops.

In the greenhouse normal results have not yet been obtained with peat. The best combination of sand, peat, lime and fertilizer chemicals produced lettuce about 70 per cent as valuable as that produced with manure compost. This experiment is also furnishing information about the utilization of peat in outdoor farming.

Where oats and peas were plowed under with 8 tons of stable manure, and fertilizer chemicals used prior to setting out celery, the yields of celery and of the cabbages which followed in the next spring were as high as with 16 tons of stable manure and less fertilizer chemicals. By scattering the fertilizer chemicals about the tomatoes, certain combinations with the green manures compared quite favorably, for the first time, with 16 tons of stable manure and less fertilizer.

After the third year of reducing the stable manure, when used with fertilizer, from 32 to 16 tons, the indications are that, with the possible exception of early spinach, the reduction may be made economically if fertilizers are used liberally. The rotation is—1st year, beets, cauliflower; 2nd year, spinach, carrots; 3rd year, eggplant.

In a comparison of nine rapid-growing crops to see which will produce, after the middle of July, the most dry matter for possible humus formation, pearl millet exceeded the others in the moist season of 1919.

Fall plowing as compared with spring plowing of grass sod in preparation for potatoes again resulted in no average difference on our silty soil.

EFFICIENCY OF FERTILIZERS AND OTHER MANURES.

The insoluble nitrogen in a number of brands of commercial fertilizers was found to be of poor quality, as stated in the annual fertilizer inspection circular.

Nitrate of soda continues to be superior to sulfate of ammonia and cyanamid as top-dressing for grass. The nitrogen in the latter two sources has produced about a fifth less crop than that in nitrate of soda.

Where 80 pounds of nitrogen per acre were supplied, and an

attempt made to approach an equal condition of neutrality, nitrate of soda and sulfate of ammonia each produced about the same sized crops of buckwheat, parsnips, peppers and sugar beets. The fact that four times as much spinach was produced with nitrate of soda as with sulfate of ammonia, however, indicated that the latter had not yet been accompanied with sufficient extra lime to overcome entirely its property of increasing soil acidity. The use of sulfate of ammonia for crops sensitive to acid-soil conditions is liable to be disappointing unless very careful attention is given to the lime requirements.

In about three-fourths ton of floats or raw phosphate rock, 450 pounds of phosphoric oxid were plowed in with a good clover aftermath in 1917, to be compared for four years with annual applications of 50 pounds of phosphoric oxid in acid phosphate; by 1919, therefore, 4.5 times as much phosphoric oxid had been added in the floats as in acid phosphate, yet in 1919 only cabbages yielded better possibly with the floats; oats and soy beans grew considerably better with the acid phosphate. Carrots again exhibited their ability to secure from the soil all the phosphorus they needed even where none had been added for at least 25 years; the rutabaga turnips could not grow at all under the same conditions.

For quick action in supplying phosphorus, and neutralizing soil, "Barium-phosphate" was useless for lettuce grown in pots.

About 15 tons of silage corn were produced where fertilizer chemicals were compared with four cords of cow manure and straw bedding, or an equivalent amount of manure with planer-shavings bedding. There was a possible small advantage with the straw manure and also from adding potassium to the shavings manure, the same as when corn was planted previously in this rotation in 1916, but no gain from adding phosphorus. The striking gains with rutabagas the previous fall from adding phosphorus apparently resulted in a small decrease in the corn of 1919. The unfavorable effect of a large crop of turnips on corn planted subsequently has been observed in Bulletin 175. Apparently lime tends to overcome this effect.

In Bulletin 177, containing field results of fourteen years, it is stated that "where there was an insufficiency of potassium, sodium was generally useful," and that "even in the future, conditions

may be such that attention should be given to the use of our liberal supply of sodium salts as economic supplements to a limited amount of potassium." The effect of sodium salts on asparagus is now being studied.

Upon the termination of the experiment with "rock potash fertilizer," it was stated in the Journal of the American Society of Agronomy that this material "was slightly more efficient than high-grade muriate or sulfate of potash when supplying the same amount of water-soluble potassium."

In growing early cabbages, tomatoes and lettuce, half of an application of 32 tons of horse stable manure has been replaced successfully by about a tone of 4-10-2 fertilizer. The spring crops were not larger where the amount of potassium was increased, but were larger where still more nitrogen and phosphorus were used. For the second crops in the rotation, beets, spinach and celery respectively, about three-fourths ton of 3.3-5-7 fertilizer has been used to supplement the spring application of 16 tons of manure. A response to more nitrogen still persists, however, and three-fourths ton of a 5-4-5 fertilizer may eventually prove satisfactory.

The spring crops have required very little potassium in addition to what was found available in the soil and in 16 tons of manure, but they leave so little of this for the second crops that the latter, which have no fresh application of manure, require relatively liberal applications of potassium. When phosphorus, however, was supplied in sufficient abundance to stimulate maximum growth of the early crops, its proportion could be relatively low in the fertilizer for the second crop.

PLANT DIFFERENCES AND NEEDS.

In the test with silage corn varieties, the yields were as follows:

	Ears, tons	Total, tons
Northern White Dent, from B. W. Bishop, Guilford, Conn.	6.4	19.8
Improved Leaming, from Comstock, Ferre & Co., Wethersfield, Conn.	5.7	18.6
Webber's Dent, from W. B. Frost, Bridgewater, Conn.	4.9	16.4
Ninety-day Red, from E. F. Dibble, Honeoye Falls, N. Y. .	4.1	13.8
Century Dent, from S. M. Waldron, New Milford, Conn. . .	4.3	13.0

With the exception of 90-day Red, which was not grown in

1918, the other varieties then yielded in the same order as in 1919.

When allowed to remain in the field later than the time for filling the silo, about three-fourths of the weight of ears of only Webber's dent and Century dent had hardened; the 90-day Red, Improved Leaming and Northern White Dent decreasing in maturity in the order named.

Different varieties of early sweet corn were planted May 14. Prior to August 13 there had been produced on a given area 94 dozen ears, weighing 524 pounds, of Early Dawn from Comstock, Ferre & Co., Wethersfield, Conn., and 4 dozen ears, 29 pounds, of an early strain of Quincy Market from S. Burnley, Seekonk, Mass. The first picking of Crosby's Early was made August 18, prior to which time the Early Dawn had yielded 162 dozen ears, 821 lbs., and the Quincy Market 130 dozen ears, 882 lbs. The first picking of a late strain of Golden Bantam from S. Burnley, Seekonk, Mass., was made August 26. The total yield up to September 4, when the remaining crop was harvested, was as follows:

	No. of ears.	Wt. of ears.
	Doz.	Lbs.
Early Dawn	252	1208
Quincy Market	208	1139
Crosby's Early	227	1321
Golden Bantam	199	1542

Yellow-colored soy beans sufficiently early to mature their seed were compared to determine their merits primarily for silage purposes. The following pounds of undried plants were obtained on October 10: Mongol, 109; Haberlandt, 107; Swan, 92; Amherst, 89; Austin, 89; U. S. D. A. No. 36915, 89; U. S. D. A. No. 36651, 79; Manchu, 76; Elton, 71; Mikado, 64. The first three varieties, which produced the largest total crop, were low bean yielders.

The following comparative yields of rutabagas were obtained: Long Island, 699 bu.; Imperial White, 349 bu.; and Breadstone, 603 bu.

Of the varieties of winter wheat planted in September, 1918, Jones's Red Wave and Red Chaff were more vigorous in the autumn and yielded more (about 45 bu.) than Leap's Prolific and Wisconsin No. 2 (about 30 bu.).

In competition in alternate rows, Southport red globe onions produced 601 bu., and Danver's yellow globe, 430 bu.

Fifteen different varieties and strains of celery were grown in co-operation with the Massachusetts and Connecticut stations, and detailed records taken of size, quality, bleaching characteristics, etc. An analysis of this data must be made in some other connection. There seems to be some reasons for preferring the newer easy-blanching sorts to the Golden Self-blanching.

Earliana tomatoes were compared especially for earliness, with different strains of Bonny Best. The plants were set out May 21, and the first two pickings, which were made July 24 and 31, yielded 70 per cent. more of Earliana than of Bonny Best. The total yield of Earliana was at the rate of 1008 bushels per acre, and of Bonny Best at the rate of 934 bushels. Up to August 21 the Earliana had yielded 575 bushels and the Bonny Best 367 bushels. Langdon's Campbell strain of Bonny Best was the earliest of the four strains, but on August 21 it had produced only three-fourths as much as Earliana. The former were, of course, smoother and much superior in appearance.

Seed corn from detasseled plants, which must have been cross-pollinated, yielded no differently than that from plants which were not detasseled and may, therefore, have been self-pollinated. The yield of hard corn varied only from 55 to 62 bushels regardless of whether the fertilizer was broadcasted, drilled, or half applied each way. There was likewise practically no difference last year.

The Green Mountain potato which was the chief variety grown yielded a total of about 400 bushels. The following varieties compared favorably with this, namely: Gold Coin, Mill's Pride, Pride of Vermont, Clyde, Cuban Multiplier, American Giant, Rural New-Yorker and Kasoag Russet. These last two were not among the highest yielders in the preceding year, but ranked with those which in 1919 yielded from 200 to 280 bushels, namely: Burbank, Netted Gem, World's Wonder, Rural Russet, Sir Walter Raleigh, Carman No. 3, and Dooley's. Owing to the unusual weather conditions which have been recorded, there was considerable rot at the time of digging. For each 100 pounds of large, sound potatoes at digging time there were 11 pounds of rotten ones in case of the larger-yielding group to 3 pounds in the smaller-yielding group.

In a five-year rotation of rye, clover, grass, corn and potatoes, liberal applications of phosphorus and potassium are made with-

out farm manure, but the nitrogen differs with the following yield of potatoes in bushels per acre:

Year.	No Nitrogen.	60-70 Lbs. Nitrogen.
1909.....	203	232
1914.....	387	438
1919.....	245	338
	<hr/> 835	<hr/> 1008

According to this, 173 bushels of potatoes were gained by adding 190 pounds of nitrogen in the potato fertilizer; and this is in spite of the fact that where no nitrogen is ever applied, the clover is relatively more abundant in the grass and persists longer.

The effect under similar conditions of fertilizer differing only in phosphorus and again in potassium may be seen by the following:

Year.	Amt. Phos- phoric Oxid. Lbs.	Yield Bu.	Amt. Potas- sium Oxid. Lbs.	Yield Bu.
1914.....	160	465	200	464
	80	435	100	440
1919.....	200	297	120	333
	100	318	60	322

Only 9 bushels of potatoes were gained from an increase of 180 pounds of phosphoric oxid, and 35 bushels gained from an increase of 160 pounds of potassium oxid. The situation seems to warrant the use of about 16 cwt. of a 5-8-5 fertilizer for potatoes, 12 cwt. of the same for corn, 5 cwt. of a 5-8-7 for the rye with the seeding of clover and grass, 8 cwt. of the same for the clover and grass, and 10 cwt. of a 5-8-5 for the grass alone. The average field yields from such use of fertilizer without any farm manure have been about 55 bushels of corn, 300 bushels of potatoes, 25 bushels of rye, 3.5 tons of hay with clover, and 4 tons of hay without clover.

The relative ability of different kinds of plants to satisfy their requirements for phosphorus, where that element was quite unavailable in the soil, has been shown by growing a number of different crops under the same conditions. Carrots again secured their entire needs where turnips and cabbages were practically unable to grow without phosphatic application. Beans, wheat and oats ranked between these extremes. In solution experiments with limited phosphorus, oats have made more nearly a normal growth than wheat. Positive results have not been secured yet regarding the relative ability of oats, millet, rye and buckwheat partially to

supply their needs where the supply of the different fertilizer elements is limited.

In the lime-requirement experiment, tobacco plants set out in quite acid soil made a satisfactory growth, showing that such conditions are less deleterious to tobacco than a single earlier, less-extensive test indicated. It was again demonstrated that spinach is an extremely efficient analyst for detecting variations in acid-soil conditions. The spinach showed that although additional lime has been used with sulfate of ammonia in an attempt to put it on a par with nitrate of soda, still more lime must be applied before success can be expected from the use of sulfate of ammonia, for those crops which are extremely sensitive to acid-soil conditions.

In another experiment the following crops responded to lime in the increasing order named: barley, alfalfa, carrots, mangels.

Although the growth of the potato-scab organism is promoted by liming, that of the cabbage clubroot is discouraged by liberal applications of lime. To demonstrate the latter fact, late cabbages have been grown on the same area each year, following different early crops. There has been no clubroot where the soil has been thoroughly limed with hydrated lime each spring, whereas, on the unlimed sections there was considerable clubroot in 1918; in 1919 every plant had clubroot and there was not a sixth of a yield. Certain kinds of early crops, however, have not made their best growth where the large amounts of lime were applied.

EFFECT OF CROPS ON EACH OTHER.

On the phosphate experiment, with some deficiency of phosphorus, the yield of rutabagas increased in the order named when this crop followed the rape, carrots, rutabagas, tomatoes and spring wheat of 1918.

The yield of late cabbages, grown subsequently during the same season, increased in the order named, after peas, beets, potatoes and spinach, both in 1918 and 1919.

It has been shown again in pots, as was shown earlier in the field, that, on acid soils, onions make a good growth following timothy and redtop, but a poor one following buckwheat and rutabagas.

In a pot experiment with soil taken from the field where dif-

ferent crops had been grown on the same highly-fertilized soil for five successive years, lettuce produced on acid soil relative weight of green leaves as follows: after beets, 16; after carrots, 41; after alfalfa, 78; after barley, 113. These crops are in the same order as when arranged in accordance with their increasing response to liming in the field experiment. When the four crops had received more liberal quantities of lime, the weight of the lettuce leaves was about 175, regardless of which of the four crops preceded.

Where a mixture of Leaming silage corn and Guelph soy beans was planted at the rate of 12 and 30 pounds respectively, the green weight on September 29 was composed of 10.50 tons of corn and 1.13 tons of beans per acre. Where planted separately, the corn weighed 15.00 tons and the beans 4.42 tons; that is, 17 pounds of corn on seven-tenths acre and 18 pounds of beans on three-tenths acre, planted separately, would equal the yield where the mixed seed was planted. It has been shown repeatedly that when, in a mixture, the corn is planted sufficiently thin to obtain a fourth or a fifth part beans, the yield from an acre is considerably less than when the desired proportion of corn to beans is produced by growing separately; and, furthermore, variable weather makes it difficult to estimate what proportion of beans will be produced in a mixture with any given rate of seeding. Even with the small proportion of beans obtained in 1919, slightly less area was required to grow separately the same amount of corn and beans. It does not appear, therefore, that anything was gained through the interaction of corn and beans.

CHANGING SOUR SOILS.

No positive differences resulted in connection with early potatoes whether high-magnesium limestone, high-calcium limestone or the burned and hydrated product produced from them had been added in earlier years in quantities sufficient to neutralize the same amount of acid. There appears to be no reason for avoiding the magnesian products. To calculate their calcium-oxid equivalent, add to the per cent. of calcium oxid, the per cent. of magnesium oxid multiplied by 1.39.

Largely by the continued use of sulfate of ammonia in place of

nitrate of soda in the top-dressing for lawn grasses, soil acidity has been maintained to such an extent that weeds are eliminated.

The cumulative effect of a given amount of nitrogen in various sources under acid soil conditions was shown in a marked degree on buckwheat grown in pots. Starfish, nitrate of soda and hen manure improved the conditions in decreasing order; whereas the conditions were not improved by the following: Acid fish, tankage, blood, hoof meal and horn meal. All of the materials have proved to be good sources of nitrogen under optimum conditions.

In Bulletin 180 may be found the results of a six-year field comparison of hydrated lime with limestone of different degrees of fineness. Practically, it appeared that a given calcium-oxid equivalent in that portion of any lime which is fine enough to pass through an 80-mesh sieve was equally effective, both for the first and subsequent crops, whether contained in either high-calcium or high-magnesium limestone, or in the product obtained by burning and slaking the same.

PLANT PROPAGATION.

The results with Irish Cobbler seed tubers showed very little difference whether they had been obtained from Maine in 1914, '15, '16, or '17, and grown in Rhode Island since. The degeneration which has been demonstrated with certain varieties of late potatoes of the Green Mountain group has not yet occurred with the early variety. About 2, 3 and 4 oz. potatoes cut into 2, 3 and 4 pieces yielded, respectively, 286, 228 and 236 bushels. The Enohla, another early variety, yielded about the same as Irish Cobbler under like conditions.

Many field comparisons bearing on the cause of degeneration in home-grown late varieties were vitiated by the rot resulting from late blight.

Rhode Island White Cap corn, selected differently, is being compared each year. The yields are indicating that the seed ranks in the following order: (1) from areas where the backward tassels have been removed; (2) from the progeny of ears shown by the ear-to-row method to be large producers, and (3) from corn grown in the usual way and selected only by its appearance. About a sixth increase in yield seems to have resulted so far by con-

tinuously removing the backward tassels, but conclusions are not yet warranted.

A field demonstration suggested by the U. S. Bureau of Plant Industry was conducted to test the principle that maturity and production of grain is governed by the age from beginning of germination. About a month's difference in age was attained by planting some corn kernels on April 25 and others from the same lots on May 24. Four kernels were planted in hills 3 x 3 feet. For comparison with the Rhode Island White Cap corn, the Bureau supplied U. S. selection No. 133, a yellow dent; No. 182, a white dent silage corn, and No. 193, a yellow flint corn. On May 12, the early planted kernels had sprouts a half to one inch long. The temperature dropped to 24° F. on April 26 but not to the freezing point after the 29th. The rainfall May 1-12 was 3.69 inches. A third more stalks were secured by planting late. With the silage corn, any advantage of early planting was offset possibly by the thinner stand. Data on the other varieties, which were cut and stooked about October 1 and husked December 1, were as follows:

	Yield of ears per acre.		Wt. of 100 selected ears.
	Hard	Soft	
	Bu.	Bu.	Lbs.
R. I. corn, planted early.....	50	5	37
planted late	48	7	32
No. 193, planted early.....	46	5	59
planted late	39	9	47
No. 133, planted early.....	52	2	44
planted late	45	6	39

Judging by the proportion of soft to hard ears, that planted early was more mature in case of each variety. This is frequently an important consideration from the standpoint of propagation. The heavier ears and greater maturity of the early planted may have been due to the thinner stand.

On account of the frequent depredations of field rodents when corn is dried in the shock, in the interest of accurate weight the portion of the stalk above the ear has been cut off, "topped," and the remainder left standing in the field to cure until husking time. A strict comparison of the two methods, uninfluenced by any rodent

damage, was made on R. I. White Cap corn and the following results obtained at husking time, on November 25:

Topped Corn.		Shocked Corn.	
Hard Ears.	Soft Ears.	Hard Ears.	Soft Ears.
Lbs.	Lbs.	Lbs.	Lbs.
1521	127	1385	367

Not only was more hard corn obtained by topping, but a smaller proportion of soft corn. A more complete maturity was indicated by the latter fact, a matter of importance in years when the germinating quality of the seed produced is uncertain.

INHERITANCE STUDIES WITH POULTRY AND RABBITS.

The ninth year's work on the inheritance of egg-weight has been completed and the results of the first five years of study analyzed in part. This analysis has involved mainly the normal distribution of egg-weight in a normal, homogeneous flock of hens. Among the results which are soon to be published in detail the point of greatest interest, perhaps, lies in a suggestion regarding a new method by which hens of high producing ability may be detected; and involves, not the counting of the eggs, but weighing them. This point may be summarized by the following quotation taken from the abstract in *Science*, as listed among the publications:

"The innate egg-producing ability of a hen is manifested, not only by the number of eggs laid within a year, or within some longer or shorter period of time, but also by the degree of increase or of decrease in the mean weight of her eggs, when this increase or decrease (calculated as a percentage-increase or percentage-decrease) is measured at those periods of laying (the vernal and autumnal maxima) characterized by the markedly increased laying of the flock; and on this basis, groups of hens characterized by higher producing ability can be differentiated as accurately as, and more easily than by any other known means."

The validity of this suggested law of production is supported by detailed evidence given in the paper by the same title published in the *American Naturalist*. The full results will appear subsequently in a station bulletin.

In the study of the inheritance of the "English character" in rabbits some progress has been made, although the difficulty of securing qualified field assistance, and a considerable amount of disease in the breeding stock, have served to render the breeding work difficult and unsatisfactory. Nevertheless a few more rabbits have been raised and graded. The results appear to justify the conclusion already tentatively expressed, to the effect that the selective breeding from the "high-grade" stock has served further to fix the high-grade English pattern at a point higher in the scale than at any time past in the progress of the experiment. In other words, the selective breeding seems to be giving permanent results in the modification of the English character. Whether this represents merely the increase of the variation to the upper limits of the genotype, or whether the unit character is actually being modified, remains yet to be ascertained. The results as a whole are capable of various interpretations.

STUDIES OF IMMUNITY AND INFECTION.

In this field much of the year was spent in bringing together the results of the study of organisms of the fowl cholera and the fowl typhoid groups, and the results have been published in Bulletin 174. The results and conclusions from this work are summarized on pages 201-207 of this bulletin. Several new bacterial species are herein described.

In continuation of the study of organisms of the fowl cholera type, which was published in 1918, a study has been initiated on bacteria of the *paracolon* type, as causative agents of disease in birds. This study has already indicated the existence of certain bacterial agents of disease lying outside the paratyphoid group; and, it may be added, also in some instances, outside both the paratyphoid and the paracolon groups. It is believed that the results of this work will facilitate accurate diagnosis of the diseases of poultry and thereby provide for more intelligent treatment.

In addition to the above work the studies on immunization of rabbits, fowls and pigeons against *B. avisepticus*, the causative agent of fowl cholera, by means of inoculations with killed cultures of virulent and avirulent strains, have been completed and

the data published in Bulletin 179, where the results are summarized on page 15. Other studies on the biochemical features of certain bacterial species causing disease in poultry have been completed, to which references are given in the list of publications.

Respectfully submitted,

BURT L. HARTWELL,

Director.

Kingston, R. I.

APPENDIX A.

Summaries Dealing with Certain Phases of Receipts and Expenditures for the Year Ending June 30, 1919.

SUMMARY FOR YEAR.

Balance on hand July 1, 1918.....	\$82,923 25
Total income during year.....	271,915 95
<hr/>	
Total	\$354,839 20
Total expenditures during year.....	250,875 71
<hr/>	
Balance on hand July 1, 1919.....	\$103,963 49

INCOME.

Income from students:

Tuition fees	\$1,148 34
Matriculation and incidental fees.....	5,125 19
Chemicals and laboratory supplies.....	838 55
Dormitory fees	9,658 69
Dining hall	44,828 02
Store sales	5,773 71
	<hr/>
	\$67,372 50

Income from State and Nation:

State—Maintenance appropriation	\$40,000 00
State—Repairs	10,000 00
Federal—Morrill Act of 1890 and Nelson Act of 1907	50,000 00
Morrill Act of 1862.....	2,500 00
Hatch Act of 1887—Experiment Station....	15,000 00
Adams Act of 1906—Experiment Station....	15,000 00
Smith-Lever Act of 1914—Extension Service	10,764 10
	<hr/>
	\$143,264 10

Income from other sources:

Sales and service of departments, including receipts from War Department for expense incurred for Training Detachment.....	\$56,087 72	
Interest	589 16	
Experiment Station—		
Sales and Service.....	\$4,473 60	
Interest	128 87	
	<hr/>	4,602 47
		<hr/>
		\$61,279 35
Total income		\$271,915 95

Receipts from tuition:

*Students taking course of one year or more.....	255
Students paying tuition (non-resident in Rhode Island) ..	33
Amount of tuition paid.....	\$1,148 34

EXPENDITURES.

Expenditures, exclusive of Experiment Station and Extension Service:

Advertising	\$1,238 85
Apparatus	1,742 57
Boarding	43,894 22
Books and periodicals.....	684 92
Commencement	1,665 78
Construction and repairs.....	10,402 40
Construction and repairs, special.....	1,850 64
Dormitory and land rental.....	3,354 78
Electric current furnished from outside college	648 94
Entertainment	226 32
Feed	4,337 77
Fertilizer	791 53
Freight and express.....	646 62
Fuel	10,706 84
Furniture	1,099 28
Gasoline	1,482 51
Janitor supplies	499 81
Labor (engineers, poultrymen, farm, etc.)....	21,721 38
Labor (undergraduate, exclusive of boarding department)	5,900 10
Laboratory supplies	3,309 13
Live stock	2,733 77

*Year covers period from January to June, the fall being occupied by S. A. T. C. work.

Postage, stationery and printing.....	1,504 52	
Salaries	61,189 34	
Seeds	447 00	
Stable and auto supplies.....	897 71	
Store	5,943 18	
Telephone and telegraph.....	801 37	
Tools and machinery.....	596 39	
Traveling	1,416 74	
Miscellaneous, including expense incurred for maintenance of Training Detachment.....	12,654 07	
	<hr/>	\$204,388 48
Expenditures, Experiment Station.....		35,030 90
Expenditures, Extension Service.....		11,456 33
		<hr/>
Total Expenditures		\$250,875 71

SUMMARY OF BALANCES, JULY 1.

	1919.	1918.
Morrill Fund of 1862.....	.....	.....
Morrill Fund of 1890.....	.....	.....
Smith-Lever Fund, Extension Service....	.....	.....
Hatch Fund, Experiment Station.....	.....	.....
Adams Fund, Experiment Station.....	.....	.....
State—Maintenance	\$6,348 82	\$11,429 84
State—Repairs and Improvements.....	8,326 57	.....
State—Building	79,452 78	79,629 99
Current Fund	7,466 45	10,169 55 Dr.
Trust Fund	1,547 13 Dr.	2,311 46 Dr.
Miscellaneous—Experiment Station	1,916 00	2,344 43
Reserve Fund	2,000 00	2,000 00
	<hr/>	<hr/>
	\$103,963 49	\$82,923 25



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